Human preferences of canine coat colour and length

by

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ABSTRACT

The ñBig Black Dog Syndrome (BBDS)ò is a phenomenon often reported by animal shelter workers to describe the belief that dogs with light coloured coats are consistently preferred over dark and/or black coloured dogs (Leonard, 2011). Research based on shelter adoption records is equivocal, however, with some studies finding support for BBDS and others not. In the current study, neither the small pilot study in which participants rated dogs photographs on a set of six semantic differential adjectives (Chapter 2), nor the much larger main study, in which two groups of participants (online vs. on-campus) were forced to choose their ñpreferredò dog from sets of two photos presented to them simultaneously (i.e., photos of the same breed in a dark vs. light coat colour; Chapter 3) provided any support for a bias against dark-coloured dogs. Rather, the main study revealed that online participants, in particular, showed a dark coat preference for six of the eight ñbreed groupsò created (Scenthound, Sighthound, Sporting, Terrier, Toy, and Working groups). Participants showed an overall preference for light coats in only one breed group (Primitive/Spitz) and no coat colour preference in the remaining group (Herding). Furthermore, there were not necessarily similar coat preferences shown for the individual breeds that comprised a breed group. These findings suggest that peopleôs preference for canine coat colour is complex and may involve breed-specific attributes; this is clearly incompatible with the existence of BBDS as a general phenomenon.

Coat colour preference was influenced by participant location. For example, preferences of participants from Newfoundland and Labrador (NL), a province with two official provincial dogs that occur with black coats (the Labrador Retriever and Newfoundland dog) were compared to the rest of Canadian participantsô preferences. Dark coat preferences emerged for the

Newfoundland dog, in that NL participants selected a greater proportion of black Newfoundland dogs than participants from other regions of Canada when forced to choose between the black coat and the other two coat colour variations (black and white vs. brown). In contrast, Canadians from other provinces showed a clear preference for the Landseer (black and white coat) over the other two coat colours.

Findings of these studies suggest that the concept and definition of BBDS requires reconsideration, as its very existence as a general phenomenon relating to peopleôs preferences for dog coat colour and type is in question. The strength of preferences, as measured by proportion of participantsôchoices for photographs of dogs in dark or light coats, is not extreme, again suggesting that there is no strong bias against dark-coated dogs. Though the study did reveal that participants made a significantly greater proportion of light-coat selections for one breed group (Primitive/Spitz), the majority do not show this preference. Biases may become more apparent at breed level, as preferences within breed groups varied considerably, suggesting that specific breeds are not subject to the same prejudices as other breeds. It is important to note that only photographs of identifiable purebred dogs were used in the study, and many of which were captured in professional manner, i.e. at dog shows. It is possible that colour preferences differ or are influenced differently for purebred and mixed-breed dogs. Future research should examine the issue more closely.

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Chapter 1: GENERAL INTRODUCTION

Every year in the United States, millions of dogs and cats are relinquished or otherwise end up in animal shelters; an estimated 3.7 million are euthanized, including approximately 56% of the dogs that enter shelters (American Humane Association, 2013). Many staff members working in shelters across North America report that big and/or black dogs are consistently overlooked by potential adopters in favour of lighter coloured dogs (Coren, 2011; Leonard, 2011). Consequently, it has been suggested that a greater proportion of big black dogs may be euthanized than lighter coloured dogs (DeLeeuw, 2010; Lepper, Kass & Hart, 2002; Posage, Bartlett & Thomas, 1998). This phenomenon of preferences for non-black dogs has become known as big black dog syndrome (BBDS) or black dog bias (BDB) (Coren, 2011; Leonard, 2011). Some dog breeders report that this phenomenon also occurs in breeds with mixed colour litters, i.e., darker dogs are least preferred by potential buyers (e.g., Eurasiers, Josée Dessouroux, personal communication), although Leonard (2011) suggests the problem is exclusive to shelter situations.

Popular belief in BBDS seems to be fairly well-established; indeed, there are websites and blogs that have focussed on the issue for more than a decade (e.g., "Contrary to ordinary," 2004; "Black dog rescue project," 2009; Leonard, A., (n.d.), The black dog projects; Rosenwald, H., 2008, Start seeing black dogs). More recently, there appears to be a trend of shelters offering black dogs (and cats) to adopters at a discounted fee to encourage their adoption (e.g., Kentucky Humane Society, n.d.). However, statistics from shelters on rates of adoption and euthanasia for darker coloured dogs are scarce

(discussed in Coren, 2011; Leonard, 2011). Thus, one wonders whether the belief in BBDS has been perpetuated largely through the personal observations and anecdotal reports of shelter workers. Brown, Davidson and Zuefle (2013) reviewed nine studies that analysed data from traditional shelters in terms of adoption/euthanasia rates. Additionally, they reviewed five studies that analysed data from no-kill shelters in terms of dog's length of stay. They also reported data they collected from three no-kill shelters. Several of the studies they reviewed produced conflicting results. Posage *et al*. (1998) reported findings consistent with BBDS, in which dogs that had a primarily black coat and were large in size (characteristics that often co-varied, i.e. many dogs were big and black) were less likely to be adopted than smaller or lighter coloured dogs. Lepper *et al*. (2002) also reported that dogs with black or brindle coats were less frequently adopted than dogs with red, tricolour, merle or gray coats. In addition to coat colour, Lepper *et al*. (2002) found that intact dogs of both sexes, particularly males, were overlooked for adoption. Two studies did not find dog sex to be an important factor (e.g., Nemcova & Novak, 2003 as cited in Brown *et al*., 2013). In total, eight of the nine studies using shelter data discussed by Brown *et* al. (2013) reported that size was a significant factor in determining probability of adoption/relinquishment/euthanasia. In contrast, the effect of dog colour appeared to be specific to specific geographic locations (discussed below).

It is reasonable to question the existence of BBDS when presented with conflicting findings such as those described above. It is likely that a combination of several factors influence an individual's decision when selecting a dog from a shelter. For example, the presence of specific breeds and coat colours in different areas may become

part of one's culture and schema. Thus, it is plausible that the strength of BBDS may vary geographically, if dog breeds and coat colours also vary across regions. Indeed, the conflicting results reported in Brown, *et al.* (2013) are likely due, in part, to the fact that the reviewed studies were conducted in different locations. Although the existence of BBDS is supported empirically in some studies, the belief in BBDS appears to have expanded to geographical areas in which empirical support was not found (Brown *et al*., 2013). One possible explanation for this is the popularity of websites and blogs written on the topic of BBDS. Through this channel, it is possible that people have come to believe that BBDS exists everywhere.

Like all people, individuals who hold beliefs about BBDS, such as animal shelter workers, are vulnerable to cognitive biases, such as the confirmation bias - the tendency to search for, pay attention to, or interpret events or information that confirm one's beliefs and/or expectations while (unconsciously) disregarding events that oppose their beliefs and/or expectations (Oswald & Grosjean, 2004). In addition to the confirmation bias, shelter workers may also be influenced by the bandwagon effect, which states that people's attitudes/beliefs become intensified when they learn others hold the same attitudes/beliefs, or that people tend to adopt attitudes/beliefs when they are held by others (Myers, Wojcicki & Aardema, 1977). Thus, a belief in BBDS may continue to exist in a given animal shelter or location, even if empirical data supporting its existence are lacking. These cognitive biases may also act on a more general scale, affecting the way the general public perceives dogs, especially dogs with discernible features (e.g., black coats, large size), whether these features are common to specific breeds or occur

across several breeds. There are various physical factors, in particular (described below), that have been shown to influence how humans perceive dogs. These characteristics, which may be associated with a belief about the dogôs personality (e.g., "looks friendly") may also affect their desirability as pets and/or adoptability from a shelter.

Canine Features that Affect Human Perception of Dogs

A handful of studies have investigated which canine features affect human perception of and behaviour towards dogs. Serpell (1986) and Tuan (1984) have documented that many different dog and cat breeds (e.g., Pekinese, Persian) have been selectively bred to possess neotenous features (i.e., those that look infantile; large forehead, large and low-lying eyes, and bulging cheeks). Archer and Monton (2011) found human preferences for infant facial features in both species. Photographs of pet faces with neotenous features were rated as more attractive than those without. The faces of puppies and kittens were also rated as more attractive than were adult faces with neotenous features. They also reported that pet owners rated all the photographs of pet faces (regardless of neotony or age) as more attractive than did non-pet owners. Additionally, women rated pets with neotenous faces as more attractive than did men, although there was no sex difference in the ratings for pets without neotenous features. Archer and Monton (2011) explained these results using Lorenz's (1950/1971) and Tinbergen's (1951) concept of "social releaser" in which simple features elicit specific and stereotyped reactions in other animals. Applying this to human behaviour, Lorenz (1971) suggested that neotenous faces elicited nurturing behaviour in humans. Gazzano, Zilocchi, Massoni and Mariti (2012) support this idea; they found that passersby viewed

puppies as the most "tender" and showed more interest and desire to interact with both puppies and large dogs compared to small and medium adult dogs or pit bulls. They also found that men and women noticed the dogs equally often, but in comparison to men, women reported wanting to interact with all types of dogs more.

In the same study, Gazzano *et al*. (2012) found that dog features "strongly affected people's feelings and behaviours towards them." Specifically, pit bulls incited more fear than puppies or small dogs. Large dogs also incited more fear than small dogs. When passersby who reported a negative response (e.g., fear) towards a dog were asked the reason, 17.2% reported that they were scared of that particular dog, 6.4% mentioned the size of the dog and 4.5% of the sample mentioned the dog belonged to a dangerous breed.

Factors Associated with Dog Adoption

Multiple studies have examined the role of dog features on adoption rates from shelters (Brown *et al*., 2013; DeLeeuw, 2010; Diesel, Pfeiffer, & Brodbelt, 2008; Marston & Bennett, 2003); however, no known studies have investigated whether dogs available for purchase from dog breeders are subject to the same preferences as shelter dogs. In the following paragraphs, several physical factors identified in the literature, and their relationship to adoption rates and/or length of stay in shelters, will be reviewed.

Dog Size

Dog size seems to have a relatively consistent relationship with probability of adoption, where, overall, small dogs were more likely to be adopted (Brown *et al*., 2013). Brown *et al*. (2013) reviewed nine studies that analysed data from traditional shelters and

five studies that analysed data from no-kill shelters, in addition to data they collected from no-kill shelters for their own study. Dog size was a significant factor in determining probability of adoption/relinquishment/euthanasia for five of the nine traditional shelters studies and for three of the six no-kill shelters studies. Only a single study, using data from a no-kill shelter, reported that dog size was not a significant factor in regards to a dog's length of stay.

DeLeeuw (2010) reported, based on US shelter data, that size ("smallness") was the second most important factor (after purebred status) that predicted whether a dog was adopted or euthanized. In contrast, a study conducted in the Czech Republic reported that giant breeds remained in shelters for the shortest length of time (Nemcova & Novak, 2003 as cited in Brown *et al*., 2013). Thus, there is some evidence for geographical differences in preferences regarding dog size.

Coat Colour

Large black dogs (characteristics which often co-varied) were found to be factors strongly associated with euthanasia in previous studies (Posage *et al*., 1998). Lepper *et al.* (2002) also reported that dogs with black or brindle coats were less frequently adopted than dogs with red, tricolour, merle or gray coats. Wells and Hepper (1992) calculated the percentage of coat colours adopted from a shelter in Northern Ireland and found that solid black-coated dogs were adopted more frequently than gold or black and tan dogs, but less frequently than dogs with black and white coats or yellow coats; however insufficient sample sizes were problematic. When DeLeeuw (2010) categorized yellow and gold

coated dogs as one coat colour, coat colour was significantly associated with probability of adoption, accounting for 17% of the variance. Specifically, "not having a primarily black coat" was positively related to adoption. Alternatively, Brown *et al*. (2013) found that coat colour was not a significant factor when analyzing adoption records from two no-kill shelters in New York, USA. Furthermore, in their review, Brown *et al*. (2013) reported that two more studies, in addition to Wells and Hepper (1992) described above, did not find coat colour to be a significant predictor of adoption (Diesel *et al*. 2008 as cited in Brown *et al*., 2013; Nemcova & Novak, 2003 as cited in Brown *et al*., 2013). However, they acknowledge that Diesel *et al.* (2007) found a significant relationship between dog coat colour and probability of adoption (Brown *et al*. 2013).

Fratkin and Baker (2013) examined the role of coat colour and ear shape in how humans perceive a dog's personality. Participants in the USA rated photographs of four dogs on a 10 item personality inventory: the same dog with black or yellow coat and the same dog with floppy or pointy ears. Dogs shown with yellow coats were rated as significantly more Agreeable, Conscientious and Emotionally Stable than dogs with black coats. Dogs with floppy ears were rated as more Agreeable and Emotionally Stable than dogs with pointy ears.

In a non-peer-reviewed study, conducted in British Columbia, Canada, researcher and author Stanley Coren used the Labrador Retriever to examine the role of coat colour on preferences for dog photographs and reported the results on his blog (Coren, 2011). The Labrador Retriever naturally occurs with a black, chocolate and yellow coat. Using photographs of each coat colour, Coren asked participants to rate the dogs on how much

they liked the look of the dog, how friendly they thought it was, how good of a pet it would be and how aggressive they thought it was. He found that yellow Labrador Retrievers scored significantly more favourably on all the scales except "good pet" than the chocolate Labrador Retriever, which in turn, scored significantly more favourably on all the scales than the black Labrador Retriever. These findings suggest that people may attribute more positive personality traits to light-coated dogs based solely on appearances.

Blecker, Hiebert and Kuhne (2013) examined passersby's behavioural responses to four dogs: a small, dark-coloured English Cocker Spaniel; a small, pale-coloured Tibetan spaniel-like mixed-breed; a large, dark-coloured Border Collie mixed-breed; and a large, pale-coloured Golden Retriever. They found that passersby moved further away from the dark-coloured dogs than they did when passing the pale-coloured dogs. However, most passersby considered all dogs as more friendly than threatening. When asked why, size was only reported for the small, pale dog whereas "individual factors" were reported for the other three dogs. This finding speaks to the importance of individual and breed factors in influencing how people form perceptions of dogs.

Coat Type (Length)

Preference for coat type is a largely under-examined physical trait. DeLeeuw (2010) reported that medium length coats were positively associated with dog adoption from a US Midwestern shelter. Wells and Hepper (1992) examined the role of coat type on peopleôs preferences for dogs in the UK, using photographs of dogs and manipulating coat length. They found that long hair was significantly preferred over short hair.

Breed and Source

Lepper *et al*. (2002) found that breed status (purebred vs. mixed) had the greatest influence on whether a dog was adopted from or euthanized in a shelter, such that purebreds were 1.4 times more likely to be adopted (as cited in DeLeeuw, 2010) and more likely to be reclaimed by their owners. Purebreds were also 1.8 times less likely to be euthanized than mixed breeds (Patronek, Glickman & Moyer, 1995), though these rates are likely off-set by breed-specific advocacy or rescue groups which took in 20% of purebred dogs in this particular study. There are mixed findings on whether certain breeds are favoured in shelter conditions. Patronek *et al*. (1995) for instance, found that breed did not matter in terms of adoption from a shelter. Similarly, Wells and Hepper (1992) did not find a significant relation between adoption frequency and breed, however when some breeds were re-categorized (specifically, Jack Russell Terriers were re-categorized with other terriers and an aggressive breed group was created that included Rottweilers, pit bulls and Staffordshire Terriers), breed became a significant predictor in terms of adoption (DeLeeuw, 2010).

A survey examining peopleôs thoughts on acquiring a dog through a shelter or via other means showed that just about half (53%) of respondents believed that dog breeders were the best source for obtaining a dog (Wells & Hepper (1992). Shelters were considered the best source by 31% of respondents. The least preferred source for obtaining a dog was a pet shop. Another study found a sex difference in where the owners obtained their dog (Ramirez, 2006). Women more frequently reported that they adopted their dog from a shelter whereas men more often reported obtaining their dog from a dog

breeder. Additionally, women tended to focus more on the dog's personality whereas men tended to give more importance to their dog's appearance (Ramirez, 2006). Interestingly, owner-relinquished dogs in UK shelters are twice as likely to be adopted as are stray dogs (Wells & Hepper, 1992). However, two studies conducted in the USA found stray dogs had more favourable outcomes; they had the highest rates of adoption (Notaro, 2004) or were more likely to be reclaimed (Patronek *et al.,* 1995).

Age

Lepper *et al*. (2002) reported that dog age was negatively correlated with being adopted and consequently associated with euthanasia. Consistent with this, Nemcova and Novak (2003) found that most adopted dogs in their study were two years old or younger. Brown *et al*. (2013) found length of stay in a shelter increased linearly with increasing age of adult dogs. They also found, consistent with several other studies, that puppies were preferred in comparison to adult dogs; Brown *et al*. (2013) reported shorter lengths of stay whereas Hart, Takayangagi and Yamaguchi (1998), Lepper *et al*. (2002) and Patronek *et al*. (1995) reported that puppies are more likely to be reclaimed or adopted.

Dog Sex

DeLeeuw (2010) reported that dog sex was not an important factor in rates of adoption for purebred dogs but was for mixed breeds. Specifically, male mixed breed dogs were more frequently euthanized than mixed breed females. Lepper *et al*. (2002) found that being sexually intact was unfavourable; adopters preferred dogs of both sexes

who were either spayed or neutered.. However, dog sex was not a significant predictor of adoption in Nemcova & Novak (2003)(as cited in Brown *et al.*, 2013).

Behavioural Factors

Beyond physical canine characteristics, human attitudes and expectations can influence their perception of shelter dogs. Wells and Hepper (2000) found that individuals visiting shelters showed more interest in dogs that were ñat the front of their cages, quiet and alert when viewed, that interact in a friendly manner and that are housed in a complex environment rather than a barren oneò (as cited in Marston & Bennett, 2003, p. 239). This highlights the importance of a dogôs personality and behavioural traits in addition to its physical traits. In fact, behavioural problems are the primary reason for relinquishment of dogs to shelters (Diesel *et al*., 2008; DiGiacomo, Arluke & Patronek, 1998).

Geographical and Cultural Preferences

As mentioned previously, Brown *et al*. (2013) compared the results of studies conducted in different geographical locations. Three of the nine studies that used traditional shelter records reported that colour was a significant factor in terms of adoption and/or perception; only one study reported that colour was not significant, and the remaining five studies did not report data on colour. Interestingly, the three studies in which coat colour was a significant predictor of adoption were all conducted in the United States. The only study that reported colour was not a significant predictor was conducted in Ireland. Perhaps surprisingly, findings from the no-kill shelters differed from the traditional shelter data. Only one of the six no-kill shelter studies, conducted in the United

Kingdom, reported that colour was a significant predictor of length of stay whereas three studies reported that colour was not an important factor. The latter three studies were conducted in the UK, US and the Czech Republic. Coat colour was not examined in the remaining two no-kill shelter studies. Brown *et al*. (2013) suggest that the discrepancies in the importance of coat colour are related to regional differences, both in terms of breed preference and availability. Studies conducted in US, UK and Germany have reported that large and dark-coated dogs are viewed as more dangerous and threatening than small dogs with lighter-coloured coats (DeLeeuw, 2010; Diesel *et al*., 2008; Duffy, Hsu & Serpell, 2008; Posage *et al*., 1998).

Factors Examined in Present Study

The present series of studies examined the role of coat colour (dark vs. light) and coat type (long vs. short) in conjunction with other canine (e.g., size) and human (e.g., age, sex) factors that are reported to influence human preferences of dogs. It is hypothesized that if BBDS exists, then the preferences that study participants report should be biased against dark-coated dogs. Additionally, the main study explored whether BBDS, if it exists, affects not only shelter dogs, but also dogs/puppies offered by breeders. Participants rated sets of two dog photographs that were simultaneously shown to them; dogs were shown in both light and dark coat colours, as well as in long and short coat types (separate sets of photographs for each factor). They were told that they were looking at dogs offered by one of two sources (either a shelter or a breeder). A large number of breeds that varied in size and other characteristics (e.g., historical use) were included. Participant demographics were also collected; specifically, participant

geographic location was examined to determine if it influenced preference ratings in order to ascertain whether BBDS may have some geographic or cultural basis.

CO-AUTHORSHIP STATEMENT

This research project was implemented under the supervision of Dr. Carolyn Walsh with whom the research questions and procedural design described within this manuscript were developed. Procedural designs were also presented to my committee members, Dr. Rita Anderson and Dr. Kathleen Hourihan, who gave feedback and suggestions. Dr. Hourihan provided access to and assistance with E Prime software. All data were collected by myself. Photographs were found online using Google images and may be subject to copyright. I edited the photographs as necessary (i.e. resized) using Adobe Photoshop CS5 (Adobe Systems, USA). I, nor do my co-authors, claim any rights to the photos, nor gained financially from them. They were used under the rules of Fair Use (USA) and Fair Dealing (Canada). All participants were recruited by myself in collaboration with the Canine Research Unit at Memorial University of Newfoundland, but all questions or concerns regarding this research project were directed to me. Both the pilot and main studies were approved by the Interdisciplinary Committee on Ethics in Human Research (ICEHR Reference numbers 20130165-SC and 20130937-SC, respectively).

Each chapter contains data that I exclusively analyzed and reports that I have written, with advice, edits and suggestions provided my supervisor and committee members. Dr. Carolyn Walsh is a co-author of all chapters presented as she contributed directly to both the intellectual property of this document as well as to the financial support for this project. Funding was also provided, in part, by the School of Graduate

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Chapter 2: PILOT STUDY

2.1 Introduction

It has become apparent that factors such as canine physical and behavioural characteristics can affect peopleôs preferences for dogs. Two readily apparent physical characteristics, coat colour and size (often confounded with breed) have been linked with the phenomenon known as Big Black Dog Syndrome (BBDS), a phenomenon in which black and large dogs are less preferred compared to smaller and non-black dogs, and consequently experience lower rates of adoption from shelters (Brown, Davidson & Zuefle, 2013; DeLeeuw, 2010; Diesel, Pfeiffer & Brodbelt, 2008; Lepper, Kass & Hart, 2002; Posage, Bartlett & Thomas, 1998). Interestingly, other terms have been used to describe colour biases, which make no reference to size, specifically, Black Dog Bias (BDB) and Black Dog Syndrome (BDS) ("Contrary to ordinary," 2004; "Black dog rescue project," 2009; Leonard, A., (n.d.), The black dog projects; Rosenwald, H., 2008, Start seeing black dogs). It is unclear whether preferences for coat colours in dogs are processed independently or in combination with information about dog size; that is, whether individuals take in ñthe big pictureò by processing all available information about a specific dog or by breaking down the available information into smaller details to form an opinion (e.g. ñI like the colour of that dog, but I wouldnôt want one so big.ò). As described in Chapter 1, small breeds generally have higher rates of adoption from animal shelters (e.g., DeLeeuw, 2010; Diesel *et al*., 2008; Lepper *et al*., 2002; Marston & Bennett, 2003; Patronek, Glickman & Moyer, 1995; Posage *et al*., 1998), although shelter location appears to influence which canine physical factors influence dog adoption and

euthanization rates (Brown *et al.,* 2013). One possible explanation for the geographic variation in preferences for coat colours is the concentration of black dogs in an area; if there are many black dogs in a shelter, then the choice of adopters may be limited, and shelter adoption rates not influenced by colour.

It is not clear, however, whether a dog's degree of "blackness" has any influence on people's preference or biases for coat colour. If BBDS exists, does it affect only dogs that are pure black, or is there a gradient on which dogs of varying dark coat colours are affected? One explanation for BBDS involves difficulty in potential dog adopters clearly seeing a black dog's facial expressions, particularly in insufficiently lit shelters or adoption centers (The black dog research studio; Rosenwald, H., 2008). Certainly, it is suggested that breeds or breed mixes that are large, with mainly black coats, are at a higher risk of not being adopted. In his blog, Coren (2011) states that black-coated Labrador Retrievers, Shepherd mixes, pit bulls and Rottweilers are particularly vulnerable to being overlooked in shelters by potential adopters. As well, under typical shelter conditions, dog coat colours such as dark brown, brindle or mixed black and white may also appear black. Thus, any study that evaluates BBDS might also need to include investigating peopleôs preferences for other ñdarkò coat colours, not just black.

To investigate colour preferences for dogs in an informal study, Coren (2011) showed people photographs of various breeds but only compared their ratings for Labrador Retrievers (Labs), as this breed naturally occurs with different coat colours (yellow, chocolate and black) and, as such, could be useful to indicate how coat colour affects participantsô perceptions. Undergraduates at the University of British Columbia

were asked to rate each dog photo on a 1-7 point scale reflecting how much they liked the look of the dog, how friendly they thought the dog was, how good of a pet the dog would be, and its potential to be aggressive. Coren (2011) found that the darker the dog, the less favourably it was rated; that is, black Labs were rated significantly less favourably than chocolate Labs, and chocolate dogs were rated significantly less favourably than yellow Labs on all traits except "good pet." Chocolate and black dogs did not differ from one another on this trait whereas yellow dogs were rated more favourably. Coren interpreted these findings as supportive evidence of BBDS for Labrador Retrievers.

The familiarity or exposure that people have to a particular breed of dog and/or, perhaps, a particular coat colour, may influence preference ratings for that dog breed or coat colour, as explained by the mere exposure effect (Zajonc, 1968, 2001). In this well-known social psychological phenomenon, a personôs preference for someone or something increases with mere exposure to it; that is, people tend to like what they are familiar with. The province of Newfoundland and Labrador offers a unique study opportunity to explore colour preferences due to having two largely celebrated breeds, the Labrador Retriever and the Newfoundland dog/Landseer, that both naturally occur in three different coat colours. Black coat colour genes are predominant in these two breeds (Davol, 1996; Schmutz, 2014, respectively), so it is likely that residents of the province are exposed to a larger number of black-coated Labrador Retrievers and Newfoundland dogs relative to dogs with the other coat colours. Indeed, tourism advertisements and souvenirs often feature these black dogs (personal observations). Mere exposure effect suggests that residents could develop a liking to the dogs in the coat colour that is most

commonly seen, i.e., show a preference for black coats. It is unknown, however, whether this liking would expand to include black-coated dogs of other breeds. To further examine this, participants were asked to report whether they had ever owned a dog with a primarily black coat.

I developed a pilot study to examine the role of coat colour on people's ratings for six small and six large breeds of dogs that naturally occur with both light and dark coats. A pair of photographs, for each of the 12 breeds, were matched for similarity in dog stance, expression and background. Occasionally, it was impossible to find a completely black dog to match the light-coated version of the breed. A "dark" coat was used as necessary and included brindle, dark brown or mixed (with black) coats. These dark-coated dogs usually had dark faces so that visibility of the dog's facial features were similar to those of a pure black dog. Participants were then asked to rate each photographed dog on six semantic differential adjectives pairs (Attractive/Unattractive, Friendly/Unfriendly, Good Pet/Bad Pet, Sociable/Aloof, Aggressive/Non-aggressive, Easy-going/Difficult), a psychological rating scale used to measure connotation or attitude of objects, events or concepts (Heise, 1970).

To investigate people's preferences for coat colours, attendees of a pet trade show in St. Johnôs, Newfoundland and Labrador, Canada were asked to participate in a brief experiment in which they would rate photographs of dogs. Data were analysed to examine whether participantôs preferences were 1) consistent with BBDS (i.e., if dark dogs were less preferred in the semantic differential ratings), 2) influenced by dog size, and/or 3) influenced by prior ownership of primarily black-coated dogs.

2.2 Materials and Methods

2.2.1 Participants

Adults who approached the Canine Research Unit (CRU) booth at the annual "Pet Expo" in St. Johnôs, NL, Canada held in May, 2012 were invited to participate in a 5-7 minute study. They were offered a chance to enter a draw to win a $50 gift certificate to the pet shop of their choice for completing the study. Participants did not need to own a dog to participate and were permitted to complete the task at the same time as another individual; eight participants completed the task with another individual whereas the remaining 21 participants completed the task on their own.

2.2.2 Materials

A total of 28 dog photographs were selected from the internet for rating. Of these photos, four served as practice or filler photos (Dachshund, Yorkshire Terrier, Dalmatian and Rottweiler) while the other 24 were focal photos and consisted of one photo of a light and one of a dark coat color dog for each of 12 different breeds of dogs that naturally occur with light and dark coat colours: Bull Terrier, Bulldog, Chihuahua, German Shepherd Dog (GSD), Great Dane, Havanese, Komondor, Labrador Retriever, Lhasa Apso, Maltese/Poodle, Pomeranian, Staffordshire Terrier and Bull Terrier. Photos for the light and dark coat colour versions of each breed were matched as closely as possible so that the dogs' expressions and stances, as well as the angle and background, were comparable. As size was also of interest, six of the breeds were large and the other six, small. Size was defined by height (large standing over 20 inches at the shoulder and small

standing less than 20 inches) and weight (large being greater than 25 lbs and small being less than 25 lbs) as described by the breed standards of the American Kennel Club (AKC) (http://www.akc.org/). Two presentation conditions, A and B, were created in which dogs of the same breed were shown in a light coat colour in one condition, and in a dark coat colour in the other condition (see Table 2.1). The light coat photos of three of the six large breeds were randomly assigned to Presentation Condition A and the dark coat versions of those same three large breeds were assigned to Presentation Condition B. The same procedure was used for the three other size/color coat combinations. The actual order of presentation of the 12 test photos in A and B was determined by block randomization: each block of four photos included a random selection of one photo from each size/colour combination (small/light, small/dark, large/light, large/dark) and each presentation order consisted of three blocks of photos. To ensure that the order of the photos did not systematically influence the ratings, two order conditions within each presentation condition were created; the order of the test photos in Presentation Condition A1 was reversed in A2; similarly, the order of photos in Presentation Condition B1 was reversed for B2.

Table 2.1

Assignment of photos of small/large dog breeds with light/dark coats to Condition A and B for the pilot study.

Dog Size & Colour	Dog Photographed	
	A	B
Small Breeds		
Light Coat	White Chihuahua	Light Bulldog
	Light Havanese	White Lhasa Apso
	White Maltese/Poodle	White Pomeranian
Dark Coat	Black Lhasa Apso	Black Havanese
	Black Pomeranian	Black Maltese/Poodle
	Dark Bulldog	Black Chihuahua
Large Breeds		
Light Coat	Light Bull Terrier	Yellow Labrador Retriever
	White Komondor	White GSD
	White Staffordshire Terrier	White Great Dane
Dark Coat	Black Labrador Retriever	Dark Bull Terrier
	Black GSD	Black Komondor
	Black Great Dane	Black Staffordshire Terrier

Each participant rated 16 photos in one of four presentation conditions (A1, A2, B1, B2). The first photo for each order was always a Dachshund that served as a practice photo as it was referred to when the experimenter gave participants the task instructions. The other three filler photos (a Yorkshire Terrier, Dalmatian and Rottweiler) appeared after the practice photo, the sixth photo and the eleventh photo (fillers were always distributed evenly with five focal photos between). Filler photos were of breeds that had

relatively consistent coat colours and/or patterns (i.e., did not often occur in different coat colours), and thus, helped to camouflage the purpose of the study.

Six different semantic differential adjective pairs were used for the rating task (see Appendix 1). Four of the six adjective pairs (attractive/unattractive, friendly/unfriendly, good pet/bad pet, aggressive/non-aggressive) had been used by Coren (2011). Two other adjective pairs, sociable/aloof and easy-going/difficult, were added after reviewing which semantic differential pairs had been used in human perception literature (Fowlie & Cooper, 1978; Miyahara & Register, 2000, Sirius & Clark, 1994), as well as a poster on human perception of canines (Wan & Champagne, 2011).

The order of adjective pairs was the same for each photograph. To ensure that participants were paying attention to the rating scales, the positive adjective (attractive, good pet, sociable and easy-going) was positioned on the left end of the 1 ï 7 scale, while for the remaining adjectives (friendly and aggressive), favourable ratings were positioned at the right end of the scale. For analysis, the ratings for the friendly and aggressive adjectives were reverse-scored so that low values represented favourable ratings on each adjective trait.

After rating the photos, participants filled out a short demographic questionnaire to gather information about the participants, their level of experience with dogs and their ownership of dogs of particular colours.

2.2.3 Procedure

The CRU booth at the Pet Expo included an area off to the side where participants could sit in front of a monitor and use a computer mouse to complete the study. The computer monitor used to display the photographs was attached to the researcher's laptop, which was not visible to participants. The Microsoft PowerPoint slideshows were saved as Presentation Conditions A1, A2, B1 or B2 on this laptop. The rating booklets were divided evenly between the four orders and marked accordingly. They were then shuffled so that presentation condition was randomly assigned to participants. The researcher opened the corresponding slideshow when participants received their booklet. Seventeen participants were assigned to Condition A and eleven participants were assigned to Condition B.

Attendees at Pet Expo who expressed interest were told that we were interested in how people perceive photographs of different dogs. Participants supplied informed consent before beginning the experiment, and then were given the response booklets in which they recorded their ratings of all 16 photographs. While viewing a photograph, participants were asked to rate each dog on the set of six of semantic differentials (Appendix 1). Upon completion, participants were debriefed and thanked for their participation. They were told that a short summary of the study would be posted on the CRU website within a month that they could access, should they be interested. Finally, participants were given a ballot, separate from their response sheets, to enter the draw. Prior to conducting this study, all materials and procedures were approved by the

Interdisciplinary Committee on Ethics in Human Research at Memorial University of Newfoundland (ICEHR Ref. No. 20130165-SC).

2.3 Analyses and Results

All analyses were conducted using SPSS 19.0 statistical software (SPSS, Inc.). Statistical tests include two-tailed *t*-tests, chi square and general linear model (GLM) of analysis of variance (ANOVA). When Levene's test for equal variances was violated, the *t* value and *df* for unequal variances was reported. Means are presented in text or in tables when appropriate with standard deviations. The alpha value of $p = .05$ was used as a statistically significant cut-off, although due to the relatively low level of power and exploratory nature of this pilot study, *p* values close to .05 were considered potentially important in terms of relationships between variables that require more study, and thus, are also reported.

2 3.1. Descriptive Statistics

2.3.1. 1. Participants

Twenty-nine participants completed the study. The data from one participant were excluded from analysis, as neither the mean nor modal ratings made by that person overlapped with those of the other participants (i.e., the individual was an outlier). The exclusion resulted in a total of 17 participants completing Condition A and 11 participants completing Condition B ratings.

Of the 28 participants, 24 were female, 3 were male; one participant in Condition B did not provide any information about him/herself or prior/current dog ownership. Age was not available in two instances in which pairs of family members completed the rating task; they did provide dog ownership information. The age of the 25 participants with known ages ranged from 19 to 63 years (M = 36.6 years; SD = 10.8). Of the 27 participants who reported on dog ownership, five (18.5%) participants reported not owning a dog at the time of the study; nineteen (70.4%) owned a single dog, two (7.4%) owned two dogs; and one (3.7%) owned nine dogs (a dog breeder). In response to whether they currently or had previously owned a dog with a primarily black or white coat, 21.9% had owned dogs with both colours, 14.5% had owned black dogs only, 7.6% reported they had owned white dogs, and 32.4% had owned neither (e.g., they could have owned dogs with mixed-coloured coats or other colours like yellow, golden, red, brown, etc.).

2.3.2. Colour and Size

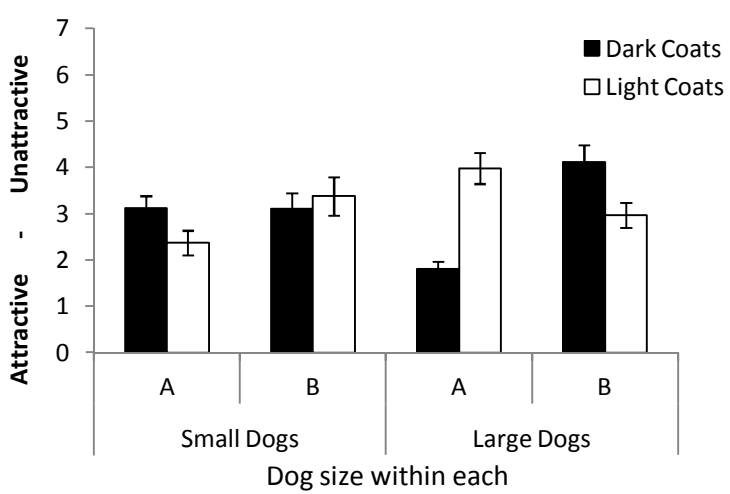
The full range of the 7-point scale was used for each adjective pair; mean ratings ranged from 2.71 to 3.63 (mode = 1 - 2 for all adjectives except *Easy-going* which had a mode of 4), in which lower scores represented more favourable ratings or perceptions. See Table 2.2 for weighted breed means across all six adjectives pairs. The composite score was calculated by summing the six adjective-pair ratings and dividing by six to give an overall mean rating. The weighted means are a composite score based on ratings given to both coat colour versions of each dog breed presented.

Table 2.2.

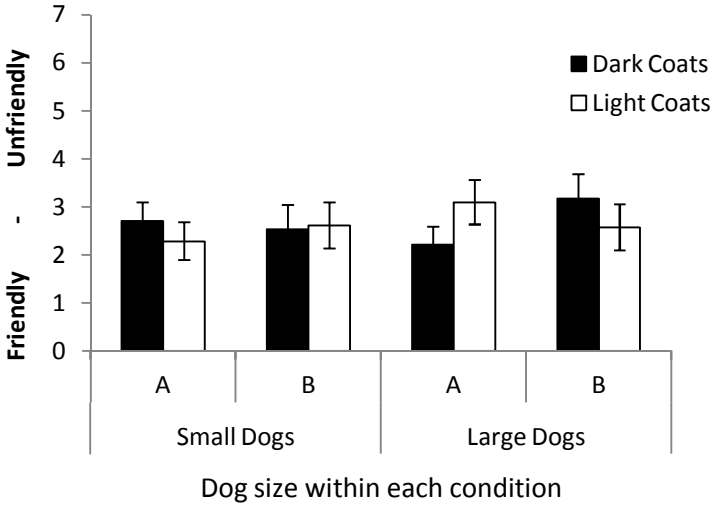
Weighted means and rank of adjective pairs by breed combined across both coat colours and conditions

Breed	Overall Mean	Rank	Attractive-Unattractive	Rank	Friendly-Unfriendly	Rank	Good Pet-Bad Pet	Rank	Sociable-Aloof	Rank	Non-Aggressive-Aggressive	Rank	Easy-Going-Difficult	Rank
Labrador Retriever	2.14	1	1.93	1	1.57	1	2.25	1	2.14	2	2.21	1	2.71	1
Maltese/Poodle	2.5	2	2.39	2.5	2.07	2	2.36	2	2.64	1	2.14	4	3.39	4
Bulldog	2.76	3	3.18	8	2.18	3	2.89	3	2.71	4	2.54	2	3.04	2
Havanese	2.88	4	3	7	2.5	4.5	3.21	5.5	3.11	3	2.25	3	3.18	3
GSD	2.95	5	2.39	2.5	2.5	4.5	3.36	5.5	3.11	7	2.93	5.5	3.43	5.5
Lhasa Apso	3.23	6	3.39	10	2.86	7.5	3.19	9	3.54	5	2.61	8	3.79	8
Chihuahua	3	7	2.68	5	2.64	6	3.18	4	2.96	8	3.11	5.5	3.43	5.5
Great Dane	3.3	8	2.46	4	3	10	3.21	10	3.64	10	3.39	10	4.07	10
Pomeranian	3.31	9	2.96	6	2.93	9	3.32	8	3.5	9	3.21	9	3.93	9
Komondor	3.45	10	4.57	12	2.86	7.5	3.68	7	3.21	6	2.68	7	3.68	7
Staffordshire	3.86	11	3.29	9	3.14	11	4.11	11	4.11	12	4.04	12	4.5	12
Bull Terrier	3.94	12	4.25	11	3.39	12	3.89	12	4.29	11	3.64	11	4.18	11

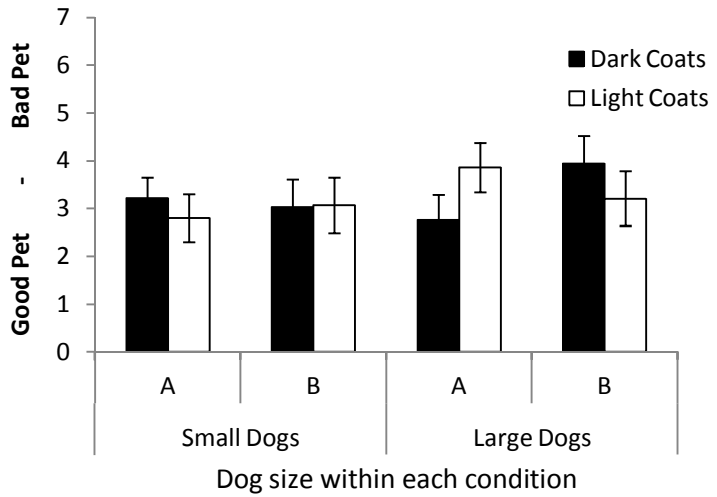
A General Linear Model (GLM) Analysis of Variance (ANOVA) was performed to determine the effect of coat colour (dark vs. light) and size (small vs. large) on how participants rated dog photos on each adjective pair. Since participants only saw one colour version of each breed, presentation condition (A or B) was a between-subjects variable, while coat colour and dog size were within-subjects variables. A significant color x size x condition interaction was found in the analysis of the ratings for all adjective pairs, as well as the overall or composite score (see below for F values). The pattern of this interaction is similar for all adjective pairs and seemed to reflect participant responses to the large breeds (i.e., Bull Terrier, Komondor, Staffordshire Terrier, Labrador Retriever, German Shepherd Dog, and Great Dane). That is, as can be seen in Figure 2.1, ratings by colour (dark vs. light) for the large dogs appear to differ with Condition, whereas ratings by colour for small dogs did not differ greatly with Condition. Based on this, further examination of the differences in coat colour preferences for the large breeds only was conducted in follow-up 2 x 2 mixed ANOVAs for each adjective pair, in which condition (A vs. B) was the between-subjects variable and coat colour (dark, light) was the within-subjects variable. A consistent colour x condition was found for all adjective pairs (see below).


Attractive - Unattractive
7
6
5
4
3
2
1
0
Dark Coats
Light Coats
A
B
A
B
Small Dogs
Large Dogs
Dog size within each

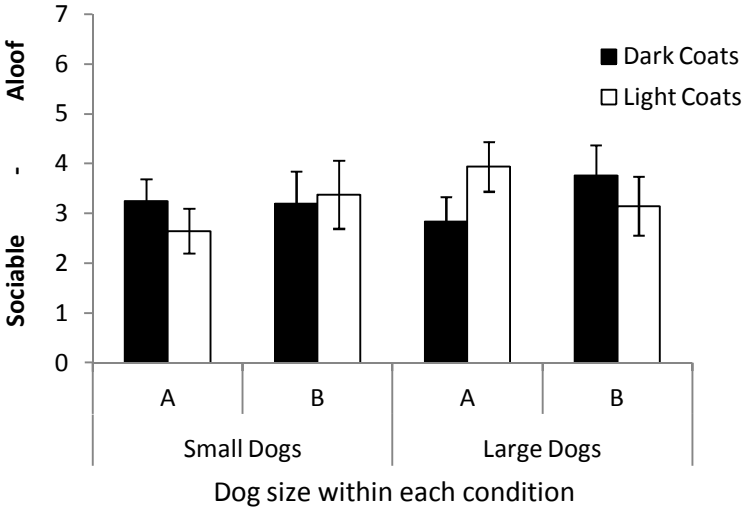
a.


Friendly - Unfriendly
7
6
5
4
3
2
1
0
Dark Coats
Light Coats
A
B
A
B
Small Dogs
Large Dogs
Dog size within each condition

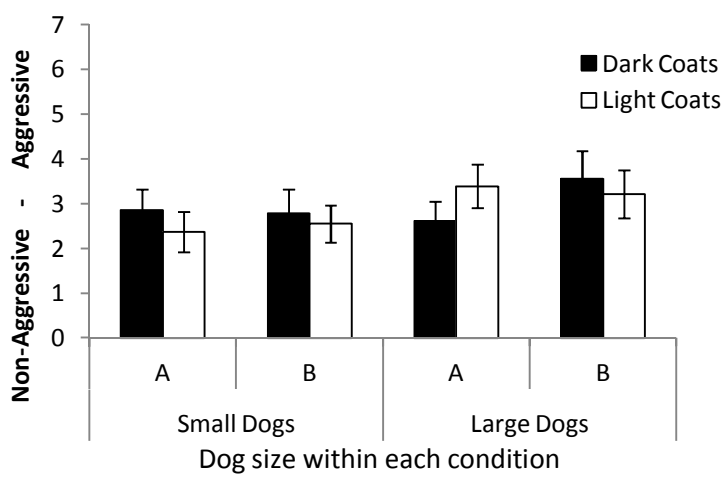
b.


Good Pet - Bad Pet
7
6
5
4
3
2
1
0
Dark Coats
Light Coats
A
B
A
B
Small Dogs
Large Dogs
Dog size within each condition

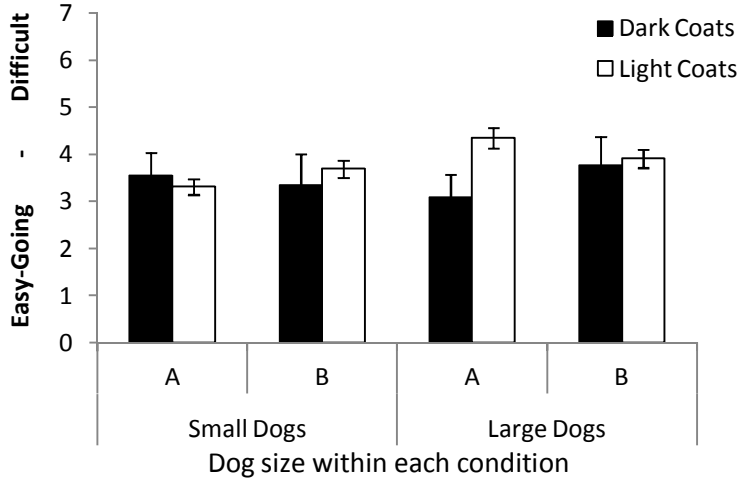
c.


Sociable - Aloof
7
6
5
4
3
2
1
0
Dark Coats
Light Coats
A
B
A
B
Small Dogs
Large Dogs
Dog size within each condition

d.



e.



f.

Figure 2.1a-f. Significant three-way interactions (except Fig. 2.1b) between condition, dog size and colour for Attractive/Unattractive (a), Friendly/Unfriendly (b), Good Pet/Bad Pet (c), Sociable/Aloof (d), Aggressive/Non-aggressive (e) and Easy-going/Difficult (f). Also interesting to note is that large/light dogs in Condition B were consistently rated lower than large/light dogs in Condition A. Error bars represent the 95% CIs.

Attractiveness. A main effect of condition emerged, $F(1, 327) = 7.33$, $p < .008$, where participants in Condition A rated dogs as more attractive than did participants in Condition B. This main effect was qualified by a colour x condition interaction, $F(1, 327) = 8.78$, $p < .004$, which was again further qualified by a colour x size x condition interaction, $F(1, 327) = 22.79$, $p < .001$. The follow-up 2 x 2 mixed ANOVA, where condition was the between-subjects factor and coat colour ratings for large dogs was the within-subjects factor revealed a main effect of condition, $F(1, 164) = 4.96$, $p < .028$, and a significant colour x condition interaction, $F(1, 164) = 32.18$, $p < .001$. Participants in Condition A rated large, light dogs as less attractive than large, dark dogs, whereas in Condition B, the large dark dogs were rated as less attractive than the large, light dogs (Fig 2.1a).

Friendliness. A significant colour x size x condition interaction emerged, $F(1, 327) = 8.68$, $p < .004$. No other significant interactions or main effects emerged from the three-way mixed ANOVA. However, the follow-up 2 x 2 mixed ANOVA for large dogs only revealed a significant coat colour x condition interaction, $F(1, 164) = 10.52$, $p < .002$, in which participants in Condition A rated dark-coated dogs as friendlier than light-coated dogs. In contrast, participants in Condition B rated light-coated dogs as friendlier than dark-coated dogs (Figure 2.1b).

Good Pet. A significant main effect of dog size, $F(1, 327) = 4.67$, $p < .032$,where small dogs were rated as better pets than large dogs emerged that was qualified by a significant colour x size x condition interaction, $F(1,327) = 7.79$, $p = .007$. The follow-up 2-way mixed ANOVA examining differences in ratings for large dogs revealed a significant coat colour x condition

interaction, $F(1, 164) = 10.56$, $p < .00$, such that participants in Condition A rated large, dark dogs as better pets than large, light dogs whereas in Condition B, participants rated large, light dogs as better pets than large, dark dogs. See Figure 2.1c.

Sociability. A significant colour x size x condition interaction again appeared, $F(1, 327) = 8.46$, $p < .005$). No other interaction or main effect was found in the 3-way mixed ANOVA analysis. However, the follow-up two-way mixed ANOVA for large dogs revealed a significant coat colour x condition interaction, $F(1, 164) = 9.58$, $p < .003$, in that participants in Condition A large dark, dogs as more sociable than large, light dogs whereas participants in Condition B rated large, light dogs as more sociable than large, dark dogs. See Figure 2.1d.

A*ggressiveness.* A significant main effect of dog size was revealed, $F(1, 327) = 8.97$, $p < .003$, where small dogs were rated as significantly less aggressive than large dogs. This main effect was qualified by a colour x size x condition interaction, $F(1,327) = 4.98$, $p < .027$. Additionally, the 2 x 2 mixed ANOVA again revealed a significant coat colour x condition interaction for large dogs, $F(1, 164) = 4.62$, $p < .033$, in that participants in Condition A rated large, dark dogs were rated as less aggressive than large, light dogs whereas participants in Condition B rated large, dark dogs as more aggressive than the large, light dogs. See Figure 2.1e.

Easy-Goingness. A significant colour x size x condition interaction emerged, $F(1,327) =4.09$, $p = .045$. No other interactions or main effects were found for the three-way mixed ANOVA, however the follow-up two-way mixed ANOVA revealed a main effect of coat colour for large dogs, $F(1, 164) = 6.47$, $p < .013$, where dark-coated dogs were rated as more easy-going than light-coated dogs. However, the colour effect was qualified by a coat colour x condition effect, $F(1, 164) = 4.01$, $p < .013$, such that participants in Condition A rated large, dark dogs as

more easy-going than large, light dogs. In Condition B, however, participants rated large, dark dogs more similar to large, light dogs in terms of easy-goingness. See Figure 2.1f.

Overall Mean Score. A significant main effect of dog size was revealed, $F(1, 327) = 5.33$, $p < .022$ where small dogs were rated overall more favourably than large dogs. This main effect was qualified by a significant colour x condition interaction, $F(1, 327) = 4.52$, $p < .035$, and was further qualified by a significant colour x size x condition interaction, $F(1, 327) = 14.59$, $p < .001$. The follow up 2 x 2 mixed ANOVA for large breeds again revealed a significant coat colour x condition interaction, $F(1, 164) = 17.98$, $p < .001$ such that participants in Condition A rated large, dark dogs overall more favourably than they did large, light dogs ($M = 2.55$, $SEM = .19$ and $M = 3.77$, $SEM = .19$, respectively). In contrast, participants in Condition B rated large, light dogs overall more favourably than large, dark dogs ($M = 3.17$, $SEM = .23$ and $M = 3.72$, $SEM = .23$, respectively).

2.3.3 Influence of Prior Dog Ownership on Ratings

To determine whether participants who ever (currently or previously) owned a dog with a primarily black coat rated the dark/black dogs presented in the study differently than participants who reported never owning a black dog, a series of independent samples *t* tests were conducted for each condition (A and B) separately, as dog breeds were shown in different coat colours in each condition. Whether participants had owned a black dog (Yes, No) was the between-subjects variable and ratings on the semantic differentials were dependent variables. The results did not reveal any effects of ever owning a primarily black-coated dog on the semantic differential ratings for either dark-coated or light-coated dogs.

2.4. Discussion

This pilot study was designed to provide insight on three questions relevant to BBDS: (1) to investigate whether evaluative ratings collected from a population familiar with dogs were influenced by coat colour, (2) to evaluate the effects of dog size on the ratings to determine whether the "black dog bias" applied equally to small and large dogs, and (3) to explore whether previous coat colour ownership influenced the ratings.

2.4.1 Black Dog Bias - General Phenomenon?

The results were not consistent with BBDS as a general phenomenon; rather, some adjectives appeared to be tied to specific dog breeds, and coat colours. There was a consistent colour x size x condition interaction, in which different participants who saw the same breed (and thus size) of dog in either a light or a dark coat colour (depending on condition), rated the dog differently on most of the adjective pairs. This finding shows that rating scores were consistently affected by the coat colour of the dog in the image presented. Since this interaction appeared to be influenced mostly by the large dog images, follow-up analyses on large dogs revealed a consistent colour x condition interaction. For large dogs, there was a consistent preference for dark dogs in Condition A whereas the opposite pattern was observed for Condition B. This effect may be partially driven by the Labrador Retrievers; the black Labrador Retriever was included in Condition A and earned the most favourable ratings on all adjectives except ñsociableò, and was ranked overall as the most preferred dog. Condition B included the yellow Labrador Retriever. Regardless, this colour x condition interaction suggests there are breed-specific "preferences" or views held about the dogs of a certain coat colour within a breed, otherwise coat colour preferences would not be expected to differ between conditions.

It is interesting to note that the black Labrador Retriever was rated most favourably overall in this study, as this result is contrary to Coren (2011), in which he reported that yellow Labrador Retrievers were consistently favoured over both chocolate and black Labrador Retrievers by his participants in British Columbia, Canada. An Australian study found coat colour in Labrador Retrievers to be associated with problem behaviours, where gold (or yellow) Labrador Retrievers had higher rates of problem behaviours than chocolates or blacks (Kobelt, Hemsworth, Barnett, Coleman & Butler, 2006). In terms of aggression, other researchers found yellow coats were overrepresented, while chocolate Labrador Retrievers had low presentation rates for aggression (Houpt & Willis, 2001). If people are using such experience or knowledge with yellow-coated Labrador Retrievers on which to base their ratings, yellow Labradors would be predicted to be less favourably rated, as they were in this study. However, the possibility that the relationships between coat colour and behaviour in different dog breeds are related to the prevalence of different breeding lineages in different geographic locations exists; thus, coat colour and behaviour relationships may differ based on breeding lines that are represented in an area, as could the perceptions of dogs with different coat colours. Future studies could investigate differences regarding aggressiveness in breed lines beyond Labrador Retrievers (Kobelt *et al*., 2006) and English Cocker Spaniels (Podberscek & Serpell, 1996) and their association with coat colour, i.e., genetic connections between coat colour and behaviour.

The discrepancy between the rating data collected in British Columbia by Coren (2011) and those collected in the present study in Newfoundland highlights questions about the importance of regional or cultural factors on human perception of dogs. The province of Newfoundland and Labrador has two breeds of dogs that share its name: the Labrador Retriever

and the Newfoundland dog. These breeds obviously are part of the cultural heritage of the region and are greatly celebrated in the province. Newfoundland dogs are traditionally black in colour according to the Canadian Kennel Club's breed standards (CKC, http://www.ckc.ca/en/), and the dominant coat colour of Labrador Retrievers is also black (Houpt & Willis, 2001). Popularity and/or familiarity with black dogs, especially in their native area, could have influenced the local participants in this study. This result would be consistent with the availability heuristic that states people tend to be influenced by what is readily available in their memories, especially memories that are vivid, unusual and/or emotionally charged (Schwarz, Strack, Bless, Klumpp, Rittenauer-Schatka & Simons, 1991; Tversky & Kahneman, 1973). This cognitive bias, in combination with the mere exposure affect, could be responsible for the less favourable ratings given to the Komondor, as many participants told the experimenter after the study was completed that they were not familiar with the breed. However, it is important to note that overall, all dogs received positive rating scores, regardless of colour, which might be expected given the study participants were attending a Pet Expo, and were likely highly interested in pets/dogs.

2.4.2 "Big" black dog syndrome - the effects of size and breed

Another goal of the study was to investigate the effect of size on evaluative perception, and whether ratings consistent with a ñblack dog biasò would appear equally to black dogs of small and large breeds. Large, dark dogs in Condition A were often rated more favourably than large, light dogs (with the opposite being the case for Condition B). This suggests that, if any particular bias underlies the rating scores, it is operating on factors other than dog size alone.

2.4.3 The effect of coat colour ownership

There were no differences in ratings based on participants past or current ownership of a primarily dark-coated dog. That is, all participants, whether they previously or currently owned dogs with primarily black and white coats, black coats but not white, white coats but not black or neither black nor white-coated dogs, rated the dark and light versions of dogs similarly. This may be explained by most people having interactions with many different coloured dogs, including black and white; ownership is not necessary for these interactions to take place and is not needed for participants to develop a schema of specific breeds, colours or types of dogs they have encountered.

2.4.4 Limitations

Because the photographs used in this study were obtained from the internet, the sex or reproductive status of the dogs were not always known. Thus, we are unable to investigate any potential influence of the sex of the dogs on ratings given in this study. It is unclear whether participants can accurately identify male and female dogs from photographs unless the genital area of the dogs is clearly visible, which was the case for four dogs in Condition A and three dogs in Condition B. Some morphological features are associated with males or females, particularly sexually intact dogs (e.g., males of many breeds may be heavier-set or larger, while females may have finer features), could potentially have influenced participant ratings. Indeed, it has been previously reported that males display significantly more dominant-aggressive behaviour than females (Cameron, 1997; Guy *et al*.,, 2001; Landsberg, Hunthausen & Ackerma, 1998; Perez-Guisado, Lopez-Rodriguez, & Munoz-Serrano., 2006). However, Podberscek and Serpell (1996) report that neutered females were more likely to show aggressive behaviour

towards children, if present in the household. Again, participantsô previous experience with dogs of both sexes, or one sex, could influence their ratings if, in fact, they were sensitive to the sex of dogs in the photos.

This study is also limited from having only used photographs of purebred dogs. Lepper *et al.* (2002) show that, when available for adoption, purebred dogs are adopted at higher rates than mixed-breeds. Additionally, they reported that most dogs available for adoption were mixed breeds. If these statistics are similar in most shelters, then applying the results of this study to dogs in shelters, which appears to be the primary source at which BBDS is believed to operate, should be done cautiously.

The results of this study are also limited to the degree to which they can be generalized. The participants that completed the study were recruited while attending a Pet Expo. Thus, there is a strong self-selection bias where participants are assumed to be as, or more, interested in dogs than the general population.

2.5. Conclusion

The results of this pilot study suggest that when people are asked to rate dogs of different colours on pairs of adjectives representing the semantic differentials (attractive-unattractive, friendly- unfriendly, good pet- bad pet, sociable- aloof, aggressive- non-aggressive and easy-going- difficult) colour preferences emerge in a complicated manner, especially for specific breeds. It appears that ratings for specific breeds were influenced by which colour version of the dog was presented (in different conditions) to participants. The next study will investigate coat preferences by selecting breeds with both dark and light coat colours and asking participants to indicate their colour preferences while seeing both colour versions of the dogs simultaneously.

As well, the pilot study data suggest that geographic location may interact with dog coat colour to influence preferences. Thus, in the next study, participant demographics, particularly geographic location will be investigated to see whether coat colour preferences may be influenced by culture and exposure effects.

Chapter 3: MAIN STUDY

3.1 Introduction

Findings from the pilot study described in Chapter 2 suggest that people's preferences for dogs of a particular coat colour, e.g. a light or dark coat, may be specific to dog breeds or types. Participants' ratings of the same dog breeds were more (or less) favourable depending on the coat colour they viewed. There was little support in the pilot study for the notion that participants had an overall preference for either light or dark coat colours across all dogs for which they gave preference ratings. Thus, the pilot data call into question the notion of the Big Black Dog Syndrome; that is, BBDS may affect some breeds or types of dogs to varying degrees rather than being a general phenomenon.

The concept of BBDS is said to originate in shelter settings; most, if not all, of the research has been limited to shelter or rescue institutions (Brown, *et al.*, 2013; DeLeeuw, 2010; James, McIntyre, McConnell & Bobeck, 2013; Leonard, 2011; Lepper *et al.*, 2002; Posage *et al.*, 1998). Leonard (2011) reports that the phenomenon is exclusive to animals (both dogs and cats) available from shelters. There has been little to no research, except the unpublished study reported on Coren's (2011) blog, that has investigated whether purebred dogs, most often available from breeders, are also affected by a black coat colour bias. Since breed standards include size, coat colour and behavioural components as outlined by national and international kennel clubs (e.g., American Kennel Club, AKC), any variation from a breed standard, including less traditional colours, may be viewed less favourably by prospective pet owners. Thus, for purebred dogs, colour preferences could emerge if prospective dog owners have knowledge of the breed standard and a desire to own a dog that adheres to the standard. As well, since breeders most often wish to produce dogs that meet the standard for their given breed, some breeds (i.e.,

those whose standards specify coat colour) will be more commonly found in specific coat colours. It is possible that prospective dog owners ñlike what they have seenò (e.g., the mere exposure effect; Zajonc, 1968, 2001), and for any given breed, would show a preference for the more frequently-occurring coat colour (e.g., if black is not a recognized or traditional coat colour, it may not be viewed as favourably as other lighter/more traditional coat colours). Mixed breed dogs, in contrast, do not have specific breed standards, and, thus, it would be more difficult for prospective owners to have expectations of their appearances. Thus, for mixed breeds, preconceived notions and expectations regarding specific breeds (temperament, historical use, etc.) should not influence one's perception; rather, perception may be based on only physical attributes. Nonetheless, mixed breeds may resemble particular breed ñtypesò (e.g., the so-called ñBullyò breeds that include Bulldog and pit bull-type dogs) which may influence expectations about coat colour.

Although it has not yet been established that a black-coat bias (or black dog bias (BDB)) exists in purebred dogs, *cf.* the informal study by Coren (2011), examining peopleôs preferences for morphological features in such dogs has advantages. Overall, using photographed purebred dogs allows comparisons between dogs that are very morphologically similar except for the trait in question (i.e., colour or coat length). From a practical perspective, matching photographs of mixed breed dogs for morphological features other than coat colour or length (such as body size or shape) would be very difficult. However, examining peopleôs preferences for photographs of purebred dogs should address at least some aspects of the phenomena underlying apparent BBDS. Thus, the purpose of the present study is to uncover some of the factors that may underlie BBDS by investigating coat colour and coat type/length preferences across a broad range of dog

breeds and types. In order to ensure broad coverage of body type and size, breeds from eight breed groups were used.

The dog features that people report to favour and those that appear to influence whether a dog will actually be adopted from a shelter can differ. For example, an Australian study in which participants were asked to describe their ideal companion dog found that colour was reported as not important (King, Marston & Bennett, 2009). Interestingly, most respondents in the study (39.7%) preferred large dogs, 27.3% medium and 18.1% small dogs. In contrast, DeLeeuw (2010) found that dog size, coat colour and coat type, i.e., length of coat/hair, were all significant factors predicting the adoption of dogs in a US shelter; in this study, small size, non-black and medium length coats appeared to be positively associated with the probability of a dog being adopted. Additionally, Protopopova, Gilmour, Weiss, Shen and Wynne (2012) reported that small and long-coated dogs were preferred to other morphologies in their shelter environment. The nature of the relationships between coat type/length, colour and size and how they influence preferences for dogs is unclear. It may be that dogs with longer coats appear ñsoftò or ñfluffyò to potential adopters; traits that might be associated with ideas of comfort or approachability. Whether this is the case or not, since coat type/length has emerged as a factor affecting dog adoptability in several studies, it likely plays some role in peopleôs preferences and should be examined more closely.

The pilot study described in Chapter 2 was based on the work of Coren (2011) in British Columbia, Canada, yet yielded quite different results. Coren (2011) reported that black Labrador Retrievers (Labs) received the least favourable scores on four factors (the look of the dog, friendliness, how good of a pet the dog would make, and aggressiveness) when compared to both yellow Labs (who received the most favourable scores) and chocolate Labs. The pilot study,

conducted in St. John's, Newfoundland, Canada, found that black Labrador Retrievers were rated the most favourably compared to 11 other breeds (Bull Terrier, Bulldog, Chihuahua, Great Dane, German Shepherd Dog, Havanese, Komondor, Lhasa Apso, Maltese/Poodle, Pomeranian and Staffordshire Terrier) on five adjective pairs (attractive-unattractive, friendly-unfriendly, good pet-bad pet, non-aggressive-aggressive, easy-going-difficult). On the sixth adjective pair, sociable-aloof, the Labrador Retriever was rated second to the Maltese/Poodle. This raises the intriguing possibility that geographic and/or cultural factors may explain the observed differences between the pilot study, conducted on the east coast of Canada, and Coren's study, carried out on the west coast.

The Labrador Retriever is one of two provincial dog breeds of Newfoundland and Labrador; the Newfoundland dog is the other. As such, the breeds are largely celebrated in the province, as evidenced by statues and paintings in prominent locations, memorabilia found in souvenir shops, and so forth. Black is the traditional coat colour for the Newfoundland dog (Schmutz, 2014) and is the prevalent coat colour for the Labrador Retriever (Davol, 1996). As such, it is likely that residents of the province are exposed to a large number of black-coated Labrador Retrievers and Newfoundland dogs, and residents might develop a liking of black-coated dogs via their relatively high exposure to that coat colour.

The following study has two components, aimed at addressing factors that influence human preferences for dog coat features. Firstly, an internet-based study will evaluate coat colour and length preferences for dogs across various geographic locations by utilizing dog-interest Facebook pages and websites to recruit participants, who will participate online. This study will be augmented by an on-campus study that will collect data from university students in Newfoundland in a more controlled environment. Participants in both online and on-campus

studies will be asked to indicate their preference between two photographed dogs presented on a computer monitor that differ in terms of coat colour or coat length. Participants will be shown four practice trials before completing the 156 recorded trials (40 pairs comparing Coat Type, 80 pairs comparing Coat Colour and another 18 pairs comparing Coat Colour for each Culturally Significant Breed, i.e. Labrador Retrievers and Newfoundland dog). See Table 3.1 for the breeds included for each comparison type. The coat colour preferences for the culturally significant breeds, the Labrador Retriever and Newfoundland dog, will be analyzed separately as they occur with three specific coat colours. Participants will also be asked to provide information regarding their experiences with dogs and demographic information. Comparisons between online and on-campus Newfoundland participants will be made, in order to ascertain whether online participants respond differently than those recruited on campus. Additionally, the benefits and restrictions of online vs. in-person studies will be discussed.

3.1.1 Hypotheses

There are several factors hypothesized to affect coat type and colour preferences, many of which are exploratory in nature. This study will investigate if any lifestyle, experience-related or geographical patterns emerge for participant preferences for dog features, specifically: 1) participant characteristics, in terms of geographical location and the inherent cultural influences location may have on participantsô exposure to particular dog breeds or types; 2) participant experience with dogs; and 3) participant awareness of BBDS, which may also vary by region. As well, since it has been suggested that the issue of BBDS is exclusive to shelter dogs, I will investigate whether telling participants to imagine they are selecting a dog from a shelter or

breeder will influence preference selections for dog photographs. Each of these factors is discussed in further detail below.

Geography

In this main study, the coat colour preferences of participants from the province of Newfoundland and Labrador (NL) will be compared to those of participants from other geographical areas, particularly for Newfoundland and Labrador Retrievers. It is hypothesized that NL participants will prefer a greater proportion of dark-coated dogs than other participants possibly due to the mere exposure effect (i.e., relatively high numbers of culturally important black Labs and Newfoundland dogs to which they are exposed). It should be noted that Protopopova *et al*. (2012) suggested that people adopting dogs from a shelter in Florida (USA) may have preferred novel coat colours rather than those that are familiar: ñadopters may prefer dogs with unique coloration, which occur less frequently in the studied regionò referring to the ñquintessential ôFlorida dogôò.. a tan coloured, medium-sized, short-haired dogò. This was offered as a possible explanation for their results not supporting the light-coat preference that is predicted by BBDS (Lepper *et al*., 2002; Posage *et al.*, 1998; Wells & Hepper, 1992). Whether features in dogs common to an area are favoured or disfavoured, such work highlights the possible role of geographical regions in dog preferences.

Participant Demographics & Prior Dog Experience

Despite no effects of these factors in the pilot study, it is possible that participant demographics, such as dog-owning experiences, age, living situation, etc., may influence coat colour preferences. It is hypothesized that having owned or having frequent encounters with a dog with specific coat traits (colour and length) may influence subsequent preferences for those coat colours and lengths, not only through the mere exposure effect, but also through experiences

with the specific coat shedding patterns and grooming requirements. Additionally, BBDS somewhat predicts that owners of black dogs may experience a greater number of less positive interactions from strangers than owners of long-coated or lighter-coated dogs (Fratkin & Baker, 2013; Protopopova & Wynne, 2016).

Participant age and living situation may limit the budget and/or space one can offer a dog, such that smaller breeds may be preferred as they generally require less food and/or space. Furthermore, for some living situations (e.g. renting), breed size or type (e.g., weight limitation or the banning of specific breeds or types) may be imposed by a third party. It is plausible that rough or long-coated dogs may appear larger than their smooth or short-coated counterparts and thus influence coat type preferences via moderating apparent dog size.

BBDS Awareness

Beyond participant demographics, prior knowledge of the BBDS concept is hypothesized to influence coat colour preferences, such that participants who are aware of the phenomenon may compensate for the bias by making selections that indicate a preference for dark coats. As on-campus participants are expected to be generally younger and not involved in shelter work (the channels through which participants were largely recruited for the online study) they are expected to be less knowledgeable about dogs in general. A breed identification task and the self-identification (identifying as a cat/dog person or neither/both) task were used to assess involvement/interest in dogs. Participants interested in dogs or who considered themselves a dog person, were expected to be better able to accurately identify dog breeds. Additionally, because such people were more likely to be aware of BBDS than participants not interested in dogs, they may be more likely to compensate for the BBDS bias by selecting more dark-coated dogs.

Shelter vs. Breeder Condition

Coat colour preferences were expected to emerge only when participants were told that the dogs they were choosing between were at a shelter; participants who were told that the dogs were offered by a breeder were expected to show little preferences for coat colour. Previous literature and the origins of BBDS suggest that BBDS is a phenomenon that exclusively affects dogs (and cats) in shelter situations (Leonard, 2011). As previously mentioned, no known peer-reviewed studies have examined whether light-coated purebred dogs tend to be preferred over their darker-coated littermates, although at least one dog breeder has suggested it is the case (Josée Dessouroux, personal communication). As well, Coren (2011) used purebred Labrador Retrievers in his unpublished study, the results of which provided support for a BBDS in the breed. However, BBDS is most often and strongly associated with shelter dogs. Thus the current study hypotheses that participants who are told that the dogs are being offered by a shelter will indicate a preference for fewer dark-coated dogs than participants who are told the dogs are being offered by breeder. This preference however may be reversed for BBDS aware participants in this condition, whereby they select more dark-coated dogs to compensate for the bias.

Coat type preference may be influenced by the shelter vs. breeder condition in a manner similar to coat colour. As described earlier, some studies have found that medium (DeLeeuw, 2010) and long coats (Protopopova *et al*., 2012) were positively associated with the probability of a dog being adopted from a shelter. However, how coat type influences potential adopterôs preferences remains unknown. Participants in the shelter condition in the current study might be expected to have more selections for longer coat types than will participants in the breeder condition.

3.2 Materials and Methods

3.2.1 Participants

3.2.1.1 Online Study

The online study was accessible for 18 days, from Friday, March 1, 2013 until midnight Monday, March 18, 2013. Participants were recruited through the popular social media website, Facebook and through e-mail, via a statement that anybody over the age of 18, whether they owned a dog or not, was invited to participate in a study examining peopleôs preferences for photographed dogs. A brief description of the task was presented with a link that directed participants to a new page saying that they would be redirected to SurveyMonkey (https://www.surveymonkey.com/) where they could complete the study. The description and link were posted on the researcherôs personal Facebook page, as well as on the Canine Research Unit page, and people were encouraged to share the link with friends and family. Additionally, organizations, including shelters/rescues/humane societies, breed and training groups and general dog interest groups with Facebook pages were contacted and asked if they would consider posting the study description and link on their pages and/or for permission to post on their Facebook wall via the researcherôs Facebook account. Similar organizations without Facebook pages were also contacted via e-mail with the same description and link and asked to consider forwarding the information in their newsletter and/or with their organization members. A total of 857 completed surveys were returned, however, only data from 818 North American participants were included in the analyses (see section 3.3 Analysis and Results below).

3.2.1.2 On-Campus Study

The on-campus study ran for 20 days, from Tuesday, March 12, 2013 until Monday, April 1, 2013. Posters with tear-off contact information advertising the study were posted on bulletin boards around Memorial University campus on Monday, March 11, 2013. The posters stated that participants would be compensated $10 for their participation in a study "investigating preferences in regards to man's best friend - dogs." In addition to the posters, the researcher visited an undergraduate course to invite members of the class to participate. The study description and contact information was also posted on the course webpage. Students from the class earned class credit in addition to the $10 given to all participants. The study description was then posted in two (Psychology and Biology) graduate associations via their Facebook groups/pages. All participants were asked to contact the researcher to set up a convenient time to complete the study in a computer lab on campus. A total of 73 on-campus participants completed the study.

3.2.2. Materials

3.2.2.1 Preference Trials

Participants saw 200 pairs of photos of matched dogs (defined below) that varied either in coat type or coat colour. Only two photos were presented at a time. All photographs (including eight practice images) of dogs were found on the internet by using Google image search and were presented in both the online and on-campus studies. The 196 preference trials consisted of photos of 80 pairs of dogs to examine coat colour (black/dark vs. white/light) preferences and another 80 pairs to examine coat type (long/rough vs. short/smooth) preferences. The remaining 36 pairs examined coat colour preferences for two culturally significant breeds ï the Labrador

Retriever and the Newfoundland. For all but the culturally significant dogs, two different photos were selected (one light and one dark for the Coat Colour condition or one long/rough and short/smooth for the Coat Type condition). For the culturally significant breeds, three photographs were obtained, one of each coat colour (a black, chocolate, and yellow Labrador Retriever and a black Newfoundland, a brown Newfoundland and a black-and-white Landseer). Only two photos were presented to participants at one time (participants saw each of the culturally significant dogs twice, but never being compared to the same photo). All the photographs were matched as closely as possible so that the dogs' expressions and stances, as well as the angle of the dog in the photograph and background, were comparable. Photographs were edited (e.g., cropped) using Adobe Photoshop CS5 (Adobe Systems, USA) if necessary. See Figures 3.1a and b for a coat colour and coat type comparison sample, respectively. A photo disclaimer was presented in each study, stating that the photos were collected using Google images and may be subject to copyright. Additionally, it was stated that the researchers claimed no rights to the photos, nor were gaining financially from them, but were using them under the rules of Fair Use (USA) and Fair Dealing (Canada). Finally, it was stated that anybody owning the copyright to the photos could contact the researchers to request that their photo be removed from the study.

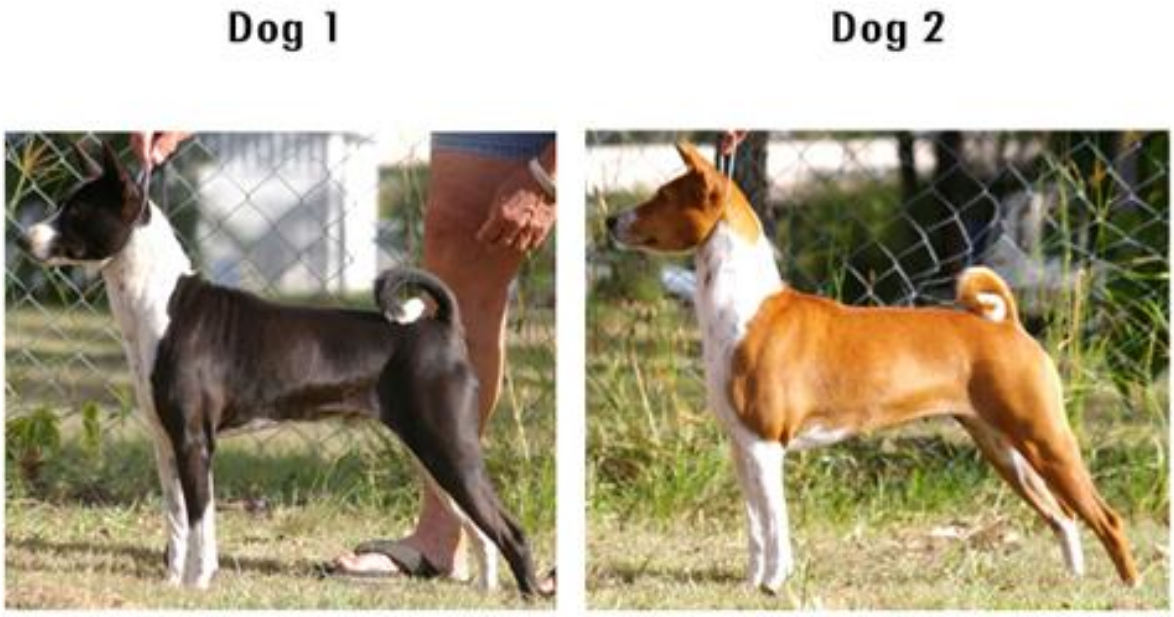


Figure 3.1a. Sample pair of dogs shown for coat colour (dark vs. light) comparison.

Figure 3.1b. Sample pair of dogs shown for coat type (long vs. short) comparison.

3.2.2.2 Breeds and Breed Groups

To ensure that a large range of dog body and breed types were selected, the Canadian Kennel Club (CKC), American Kennel Club (AKC) and Fédération Cynologique Internationale (FCI) groups were consulted (http://www.ckc.ca/en/Choosing-a-Dog/Choosing-a-Breed; http://www.akc.org/dog-breeds/; http://www.fci.be/en/Nomenclature/, respectively). The CKC has seven breed groups, the AKC has seven breed groups plus a miscellaneous group, and the FCI lists 10 breed groups. By examining these lists, I created my own list of eight breed groups (see Table 3.1). Specific breeds were then selected if they occurred with both black/dark and white/light coat colours (Coat Colour condition) or both long/rough and short/smooth coat types (Coat Type condition). Ten dogs representing at least two different breeds were included in each group for the Coat Type condition. However, due to the limited number of breeds that naturally occur in both black/dark and white/light coat colours in the Scenthound group, Scenthounds had only five representatives from two breeds (the Bloodhound and Cretan Hound). The other five were added to the Primitive/Spitz group, which was represented by a total of fifteen dogs from four different breeds (see Table 3.1). The Herding, Terrier, Toy, Sporting and Working groups had a sufficient number of breeds meeting the criteria for the Coat Colour condition and, thus, were each represented by ten dogs from at least two breeds similar to all those in the Coat Type condition.

Table 3.1

Dog breeds and corresponding breed groups (including culturally significant breeds) categorized by coat colour and coat type

Breed Group	**Coat Type (N)**	**Coat Colour (N)**	**Culturally Significant Dogs/Breeds (N)**
Herding	Border Collie (1) Canaan/Mudi (3) Collie (4) Dutch Shepherd (2)	Briard (2) German Shepherd Dog (1) Komondor (2) Mudi (2) Puli (3)	
Primitive-Spitz[a]	Alaskan Malamute (3) Chow Chow (4) Husky (3)	Basenji (1) Eurasier (5) Pomeranian (6) Sharpei (3)	
Scenthound[a]	Dachshund (4) Istrian Hound (3) Italian Scent Hound (3)	Bloodhound (2) Cretan Hound (3)	
Sighthound	Italian Greyhound (7) Saluki (3)	Afghan Hound (5) Greyhound (2) Saluki (3)	
Sporting	Curly/Flat Coated Retriever (2) German Pointer (3) Labrador Retriever/Kuvasz (2) Vizsla (3)	Cocker Spaniel (3) English Pointer (3) English Setter (3) Portugese Water Dog (1)	Labrador Retriever (18)[b]
Terrier	Fox Terrier (5) Jack Russell Terrier (3) Patterdale Terrier (2)	American Staffordshire Terrier (2) Bull Terrier (2) Cairn Terrier (3) Scottish Terrier (3)	
Toy	Chihuahua (5) Brussels Griffon (5)	Chihuahua (2) Lhasa Apso (1) Miniature Schnauzer (1) Poodle (toy) (4) Pug (2)	
Working	German Shepherd Dog (5) Rottweiler (4) St. Bernard (1)	Boxer (2) Great Dane (2) Hovawart (4) Old English Mastiff (2)	Newfoundland (including Landseer) (18)[b]

Number inside parentheses indicates number of times breed was presented.

[a] An adequate number of photographs/breeds showing both coat types in the Scenthound group was not attainable hence the breed group only have five representatives from two breeds instead of the typical ten comparisons The missing five comparisons were added to the Primitive/Spitz group, giving that group a total of fifteen dogs from four different breeds

[b] There were 6 pairs each of black, chocolate/brown and yellow/Landseer coats, respectively.

In addition to Coat Colour and Coat Type conditions, two breeds were identified as culturally significant, the Labrador Retriever and the Newfoundland dog, belonging to the Sporting and Working breed groups respectively. Three coat comparisons were made for these breeds in the analyses (Section 3.3.1.2.1.5. *Culturally Significant Breeds*) as both of the breeds occur in three coat colours: the Labrador Retriever occurs in black, chocolate and yellow, whereas the Newfoundland dog occurs in black, brown, and black-and-white. This latter coat pattern is more specific to the Landseer, which the FCI considers a separate breed; however, the CKC and AKC considered it simply a colour-variant of the Newfoundland dog. For the purposes of this study, the Landseer will be included when referring to the Newfoundland breed.

3.2.2.3 Online Study

The online study was hosted by SurveyMonkey (https://www.surveymonkey.com), a popular online survey design program and host. Pairs of photos were placed side-by-side onto a white background using Adobe Photoshop CS5 (Adobe Systems, USA). The words ñDog 1ò appeared above the left photograph and "Dog 2ò appeared above the right photograph. Images were then saved as JPEG files. All images were sized to about 150 MB, the maximum image size that could be uploaded to SurveyMonkey.

To control for possible response side preferences (left or right), a second set of image files containing the same two dogs were created. In this second set, the location of the dogs was switched (i.e., Dog 1 on the left became Dog 2 on the right). In both sets of images, above each pair of photographs, participants read "The SHELTER [or] BREEDER offers you this choice:" depending on which of the two dog source conditions (Condition A: shelter; Condition B: breeder) they were assigned. Participants were then asked "Which dog do you prefer?" above each photograph. Underneath the photographs, from left to right, the response options read: "I

strongly prefer Dog 1, I slightly prefer Dog 1, I slightly prefer Dog 2, and I strongly prefer Dog 2." A response was made by clicking the checkbox beside the chosen option (see Figure 3.1). Only one response was permitted for each trial. A response had to be selected before the participant could click on "Next" to go to the next pair of dogs.

To control for possible order effects of photograph presentation, four separate versions of the preference trials were created and uploaded to the SurveyMonkey site. To create the four different versions, all the pairs within a breed group were numbered and then randomly assigned to either the left or right side of the pair using a random number generator. Another list was created in which the left-right location of photographs was reversed. These two lists were then used to upload the appropriate image files to each study - A1, A2, B1 and B2. In lists A1 and B1, the photos were assigned to one left-right location and photos in lists A2 and B2 were assigned to the opposite side (left-right locations). The link redirected participants to an intermediate page, hosted by a Memorial University server that thanked the person for their interest and instructed them to click the button below to be redirected to the study hosted by SurveyMonkey. This page randomly assigned participants to one of the four versions of the study created on the SurveyMonkey website. Participants were unaware that there was more than one version of the study. Conditions A1 and A2 were shelter conditions and B1 and B2 were breeder conditions. The order of the photos within each study was presented in random order via the SurveyMonkey platform.

3.2.2.4. On-Campus Study

The same photographs were used for the on-campus study, however they were presented using E-Prime Professional software (Psychology Software Tools, Pittsburgh, PA). The

photographs that made up each pair were saved separately in folders. E-Prime was then configured to present the two images from each pair together on the screen. The location (left or right position) was randomly determined by E-Prime. The question "Which dog do you prefer?" was above each pair of photographs. The response options differed slightly than those for the online version and were made by pushing a letter on the keyboard. Below each response option was the corresponding letter; the letters "z" and "x" corresponded to "I strongly prefer Dog 1" and "I mostly prefer Dog 1" respectively, while "n" and "m" corresponded to "I mostly prefer Dog 2" and "I strongly prefer Dog 2" respectively. The next preference trial appeared automatically once a response was made. The order in which photographs were presented was randomized, as it was in the online study.

3.2.2.5 Breed Identification Task

Following the preference trials, participants were asked to complete a brief (20 item) multiple-choice breed identification task. For this task, a single photo of a dog representing a particular breed was displayed. Participants were asked to identify the breed of dog displayed by selecting the breed from a list of four possible choices. The same photographs and choices were given in both the online and on-campus study. The order of photos was randomized only in the on-campus version; however, the order of the choices that participants could select was randomized in the online version. In both studies, a response was required before continuing to the next photograph.

3.2.2.6 Demographic Questionnaire

The final part of the both the online and on-campus studies asked participants to provide some non-identifying demographic and other information regarding their experience with dogs.

For basic demographic information (age, sex, housing situation, location/residence), participants were asked to select the category that best described them from drop-down menus. Participants were asked to identify themselves as a male or female. Participants were then asked to select their appropriate age range in years from the following categories: <18, 18-24, 25-34, 35-44, 45-54, 55-64, 65-74, 75+. Additionally, they were asked to select their current housing situation from the following list: Campus dormitory/residence, Renting an apartment/house alone, Renting an apartment/house with others, Living in a parent's/relative's house, Own my own house or Other. If participants selected Other, they were asked to specify.

In addition to the basic demographic information, participants were asked how many dogs they currently and had previously owned (0, 1, 2, 3+) and were asked to describe them (e.g. sex, colour, breed). They were also asked where they obtained their dog(s), if they reported currently or previously owning one from a list of options: Purchased from a dog breeder, Adopted from an animal shelter, Took/adopted from a friend, Own dog had puppies or Other. If Other, participants were asked to specify.

Additionally, they were asked to identify themselves as either a dog or cat person, both or neither. Finally, participants were asked if they had ever heard that black dogs were thought to be less adoptable than lighter-coloured dogs. The demographic questionnaire was administered in paper form to on-campus participants. Both online and on-campus studies took approximately 30-45 minutes for participants to complete.

3.2.3 Procedure

3.2.3.1 Online Study

A website link was always attached to the study description when posted on Facebook pages and when emailed to potential participants. If an individual chose to click on the link, they

were redirected to an intermediate page that redirected them randomly to one of the four condition/photograph order lists, as described previously in Section 3.2.2.3. After participants were directed to SurveyMonkey, they were presented with a consent form that they were asked to read carefully (see Appendix 2). They were then asked if they wished to participate and given the options to either click ñYesò, by which they provided their virtual signature, stating that they had read and understood the consent form or alternatively, to click "No, I do not wish to participate." Participants were able to leave the study at any point by exiting the study window. If consent was given, participants were presented with the instructions for the preference trials; they were told to imagine that they were looking for a dog and had contacted either a local shelter or local dog breeder (depending on whether they were assigned to shelter or breeder condition) and that the shelter or breeder responded by sending them photos of available dogs. Based solely on the photos (they were told no other information was available), they were instructed to select the dog they preferred out of each pair (see Appendix 3). It is important to acknowledge that this manipulation was a realistic depiction of the process or types of choices participants would make if they were actually visiting a shelter or breeder; however, the purpose of the study was not necessarily to examine BBDS per se, but rather to uncover factors related to breed, dog body type, coat, and size that might influence adoptersô choices. Participants in the study were then told the following pages would provide practice.

Participants then completed four practice trials, after which they could choose to repeat or continue with the 196 preference trials. On each trial, the photo pair had ñThe SHELTER/BREEDER offers you this choice:ò statement above. Due to an unfortunate oversight, inconsistent wording was presented for the Breeder condition, where participants were told to imagine they were looking for a dog and had contacted a dog breeder, who sent them

photos of available dogs. However, the statement above the photo pairs incorrectly read "The SHELTER offers you this choice:" for the preference trials. This error was corrected on March 12th, after 362 participants had completed the Breeder condition and 377 had completed the Shelter condition. After the correction, 47 participants completed the Breeder condition in which the wording that appeared above the photos was congruent with the Breeder condition.

After four practice preference trials, participants were given the opportunity to begin the study or to restart the practice trials. Three breaks were scheduled evenly throughout the preference trials to allow participants to readjust their eyes and stretch as necessary.

Following the preference trials, participants performed the breed identification task (see Section 3.2.2.5 Breed Identification Task and Appendix 4). Following the breed identification, participants were asked to provide demographic information and information regarding their experiences with dogs (see Section 3.2.2.6 Demographic Questionnaire). The last question asked participants was ñHave you ever heard that black dogs are less likely to be adopted than other coloured animals?ò to gauge their awareness of BBDS without using specific terminology, as the bias is known by several names as previously discussed. Finally, participants were debriefed and thanked for their participation. They were provided with a link if they were interested in learning more about BBDS and told that a summary of the study results would be posted on the Canine Research Unit website after analysis was completed. Participants were also asked not to discuss BBDS with any other potential participants until after they both had completed the study.

3.2.3.2 On-campus Study

The procedure for the on-campus study closely resembled the procedure for the online study with a few exceptions. Individuals interested in participating first emailed the researcher to schedule a mutually convenient time to complete the study. When they arrived at the agreed

upon time, they were greeted by the researcher. They were asked to print their name on a login sheet, used to keep track of participants so they could be compensated appropriately (paid $10 and/or given course credit). Participants were then asked to take a seat at a computer, where the researcher read the consent form with the participants, allowing them to ask any questions (see Appendix 2). If consent was given, the researcher set up the experiment on the computer and then left the participant to complete the study in privacy. Multiple participants could complete the study simultaneously on different computers. When participants finished the study, they returned the demographic questionnaire to the researcher and were given a subject card signed by the researcher that they could cash in for $10 in the Psychology Department office. They were also given a debriefing form and thanked for their participation.

3.3 Analysis and Results

All analyses were conducted using SPSS 19.0 Statistical Software (SPSS Inc.). Statistical analyses include mixed ANOVAs, for which Greenhouse-Geisser's adjusted degrees of freedom were reported when Mauchley's test of sphericity was violated; *t*-tests and chi-square. When appropriate, post hoc comparisons using the Bonferroni correction were conducted and reported with associated *t* value of the pairwise comparisons (calculated separately using SPSS output). The alpha value of $p = .05$ was used as a statistically significant cut-off for the on-campus study analyses ($N = 73$), however a more stringent alpha value of $p = .01$ was chosen for the online study analyses to reduce the risk of Type 1 error due to increased power from the large sample size ($N = 818$) for the online study. Small differences between groups can be found statistically significant with a large sample size, but this does not necessarily reflect a meaningful difference; thus, the more stringent alpha value was chosen for the online sample.

3.3.1 Online Study

3.3.1.1. Descriptive Statistics

Because the study link was sent out to an unknown number of potential participants, and because participants could anonymously refuse to participate, it was impossible to calculate a response rate. Out of a total of 1247 participants who began the study, 857 participants completed it (68.7% completion rate). Demographic information was collected at the end of the study, and thus was available only for those who completed it. Of the 857 participants, 448 completed the shelter condition (A1, 235; A2, 213) and 409 completed the breeder condition (B1, 209; B2, 200). A chi-square showed there was no difference in dropout rate across the four conditions, χ^2 (3, N = 1247) = 4.38, p = .22. Due to an unfortunate oversight, however, inconsistent wording was presented for the breeder conditions (B1 and B2), in which participants were given the correct instructions, but the statement above the photo pairs incorrectly read "The SHELTER offers you this choice:". The error was corrected on March 12th, after 340 participants completed what is now referred to as the ñincongruent breeder conditionò. A total of 47 participants completed the corrected version of the manipulation, referred to as the ñcongruent breeder conditionò (the statement above the photos correctly read ñThe BREEDER offers you this choice:ò). To best evaluate the role of breeder condition, the incongruent and congruent breeder conditions were treated as distinct conditions; mean preferences were examined using three condition categories: Shelter, N = 432 (52.7%); Breeder (incongruent), N = 340 (41.5%); and Breeder (congruent), N = 47 (5.7%).

Participants

Participants who completed the study would have likely become aware of it through the sharing of the study link on Facebook and/or through email. Because sampling was not random, the demographic profile of the sample is not likely to reflect population level demographics.

Location

Most of the sample (N = 484, 56.5%) currently lived in Canada or the United States of America (US, N = 334 participants, 39.0%). The remaining participants lived in other countries with 21 (2.5%) from the United Kingdom, 11 (1.3%) from New Zealand, 2 (0.2%) from Australia and 1 (0.1%) respondent from each of the following countries: Brazil, Japan, Norway and South Africa. Due to low sample sizes from these countries, only data collected from participants living in North America (N = 818) were used in the following analyses.

Province/State

Participants living in Canada or the US were asked to indicate in which province or state they lived. To examine whether participants from different regions of Canada differed in preferences for coat colours and types, regions were divided as follows: Western Canada (N = 108) included participants from British Columbia (N = 10), Alberta (N = 88), Saskatchewan (N = 6) and Manitoba (N = 4); Central Canada (N = 54) included participants from Ontario (N = 49) and Quebec (N = 5); the Maritime provinces (N = 246) included participants from New Brunswick (N = 187), Nova Scotia (N = 53) and Prince Edward Island (N = 6). Participants from Newfoundland (N = 76) remained as a separate group.

The distribution of participants across the United States was widely diverse. All but five states were represented by at least one participant. The only states with more than 20 representatives were Illinois (*N* = 48, 14.4%), California (*N* = 34, 10.2%) and Texas (*N* = 25, 7.5%).

Sex and Age

The vast majority of participants were females (*N* = 755, 92.3%). Participants indicated their age using the following categories (in years): less than 18, 18-24, 25-34, 45-54, 55-64, 65-74 and 75 or older. Because the ñless than 18ò and ñ75 or olderò groups had sample sizes of nine or less, age categories were reclassified into broader life-stage categories. The life-stage groups included: 1) young adults, up to 24 years (*N* = 109, 13.3%), typically associated with post-secondary education and training; 2) adults, 25 - 54 years (*N* =518, 63.3%), typically associated with a focus on work and/or family, and 3) mature adults, 55 or older years (*N* = 191, 23.3%), typically associated with post-child rearing/work life activities.

For online NL participants, 67 (88.2%) were female, 13 (17.1%) were young adults, 46 (60.5%) were adults and 17 (22.4%) were mature adults.

Housing

Participants identified their current housing situation from a list of options that included owning their own home; renting, either alone or with others; living with a parent or relative; living in a campus dormitory/residence; and "other" and were asked to specify it. Almost half (*N* = 406, 49.6%) of participants indicated that none of the listed options described their current housing situation, but only 15 of them specified it, 11 of which could be coded. Participants (*N* = 407, 49.8%) who provided housing information were re-classified into one of three broader

housing categories: renting (*N* = 99, 24.3%), living with family (*N* = 110, 27%) and owning their own home (*N* = 198, 48.6%).

Only about half (*N* = 41, 53.9%) of the NL participants provided information regarding their housing situation: 8 (19.5%) reported renting, 12 (29.2%) lived with family and 21 (51.2%) owned their own house.

Self Identification

Half (49.9%) of the participants self-identified as primarily a dog person and another 25.6% identified themselves as both a cat and dog person; 5.6% identified as a cat person and the remaining 18.8% identified as neither.

More than half of online NLers (*N* = 41, 53.9%) self-identified as primarily a dog person. An additional 28 (36.8%) self-identified as both a dog and cat person, whereas the remaining 7 (9.2%) self-identified as a cat person.

Dog Experience

Only 17.7% of the entire North American sample reported that they did not currently own a dog whereas 32.4% reported currently owning a single dog, 23.6% reported owning two dogs and 26.1% reported owning three or more dogs. Two individuals (0.2%) did not indicate how many dogs they currently owned. When asked about previous dog ownership, 13.3% reported that they had not previously owned a dog, 16.2% had previously owned one dog, 14.8% had previously owned two dogs, 55.7% had previously owned three or more dogs and again, two participants (0.2%) did not indicate how many dogs they previously owned.

Twenty-four (31.6%) of NLers reported that they did not currently own a dog whereas 32.9% reported currently owning a single dog, 18.4% owned two and 17.1% owned three or more. When asked about previous dog ownership, 15.8% reported that they had not previously owned a dog, 23.7% reported that they had previously owned a single dog, 21.1% had previously owned two dogs and 38.2% had previously owned three or more.

BBDS Awareness

Nearly 68% (N = 553) of the North American sample reported that they had heard that black dogs were less likely to be adopted than lighter-coated dogs (no specific term was used in the question because of the variation in names, however, for simplicity, this will be referred to as BBDS awareness henceforth), whereas the remainder of the sample (N = 265, 32.4%) reported that they were not aware of BBDS. A chi-square analysis revealed that there were similar proportions of participants in shelter vs. breeder conditions who were aware/unaware of BBDS, G^2 (2, N = 818) = .42, p = .81. There were BBDS awareness differences between sexes, ages and countries: a greater proportion of females (68.9%) reported being aware of BBDS than males (52.4%), G^2 (1, N = 818) = 7.22, p = .007. More adults (69.9%) and mature adults (69.1%) also reported being aware of BBDS than young adults (51.1%), G^2 (2, N = 818) = 10.47, p = .005. Additionally, a greater proportion of participants living in the US (83.5%) reported hearing about BBDS than participants living in Canada (56.6%), G^2 (1, N = 818) = 65.40, p < .001.

BBDS awareness was divided among online NLers, such that 55.3% (N = 42) reported being aware of BBDS whereas 44.7% (N = 34) reported being unaware of the phenomenon. A chi-square analysis revealed that there were similar proportions of participants in shelter vs. breeder conditions who were aware/unaware of BBDS, G^2 (2, N = 76) = .27, p = .26. BBDS

awareness rates did not differ between sex and age groups, G^2 (1, N = 76) = .48, p = .49 and G^2 (2, N = 76) = .11, p = .95, respectively.

Dog Knowledge

Accuracy scores were calculated for each breed in the Breed Identification Task. An accurate identification was denoted by a "1" whereas an incorrect identification was denoted by a "0", thus, mean accuracy scores closer to 1.0 represent higher rates of accuracy. Overall accuracy scores ranged from 0% to 100% (none to all correct). The overall mean accuracy was 54.7% ± 1.4% ($M \pm SEM$).

Online NLers' accuracy scores ranged from 10% to 100% with the mean accuracy being 55.8% ± 4%.

3.3.1.2 Preference Statistics

Preferences for all Coat Colour trials were re-coded so that participant ratings of 1 or 2 indicated a preference for dark/black coats and ratings of 3 or 4 indicated a preference for light/white coat. Similarly, Coat Type trials were re-coded so that ratings of 1 or 2 indicated participant preference for short/smooth coats and ratings of 3 or 4 indicated preference for rough/long coats. Counts of each participantôs preference for dark or short coats were calculated for each breed composing the breed groups. The count values were then summed and divided by the number of breeds within the breed group to produce values ranging from 0 to 1 that indicated the proportion of ratings in which dark and short coats were preferred such that proportions between 0 - 0.49 indicated a preference for light/long coats whereas proportions between 0.51 -1 indicated a preferences for dark or short coats; 0.5 indicated no preference. Mean preference scores are always presented with 95% confidence intervals (CIs). In instances where 0.5 is

included in the 95% CI, it was not considered a true preference. Furthermore, a conservative approach was taken when comparing differences between groups and/or evaluating significant interactions: a true difference between groups was indicated when overlap between 95% CIs did not occur.

The value representing proportion of dark coats selected/preferred is the response variable in the following analyses. Although differences in coat colour preferences occurred between breeds in the pilot study, they were not expected to vary by breed group due to similarities in appearance or historical use, factors that were important in categorization. Despite grouping "similar" dog breeds, there was a consistent main effect of breed group in the following analyses, and thus was further explored using one-way ANOVAs and post-hoc comparisons using Bonferroni's correction to identify which breed groups received preference ratings for dark or light coats (Fig. 3.2). The culturally significant breeds (Newfoundland dog and Labrador Retriever) were analysed separately following the overall analysis of Coat Colour and Coat Type preferences. This was to determine whether culturally significant breeds were treated differently by participants, particularly those from NL. Furthermore, because online NLers and on-campus participants allowed a direct geographic and demographic comparison, analyses comparing the two groups were conducted.

3.3.1.2.1 Coat Colour Preferences

3.3.1.2.1.1 Participant Demographics

To examine the relationship between participant demographics and Coat Colour preferences for each breed group, a series of mixed ANOVAs were conducted (one for each of the following demographic variables: sex, age, housing, country, self-identification and dog

experience, i.e. number of current and previous dogs owned) where proportion of dark coats selected was the response variable. A more detailed account of the other variables examined are given in each of the subsections below.

Sex & Age

A 2 x 8 mixed ANOVA was conducted, in which sex was the between subjects variable and proportion of dark coats preferred for each breed group (8 groups - within subjects factor) was the dependent variable. Only a main effect of breed group emerged, $F(6.26, 5109.01) = 25.42$, $p < .001$. No main effect of sex or interaction effects emerged.

There was no main effect of age from the 3 x 8 mixed ANOVA where age category (young adults, adults and mature adults) was the between-subjects variable, the breed groups rated was the within-subjects variable and the proportion of dark Coat Colours preferred was the response variable. There was, however, a significant main effect of breed group, $F(6.26, 5100.14) = 43.78$, $p < .001$. This was qualified by a significant interaction between participant age and breed group, $F(12.52, 5100.14) = 4.66$, $p < .001$. Post hoc one way ANOVAs using the Bonferroni correction revealed that all participants showed a preference for dark-coated dogs; however, young adults and adults selected a greater proportion of dark-coated dogs than mature adults for the Sighthound breed group, $t(298) = 4.28$, $p < .001$ and $t(707) = 4.23$, $p < .001$, respectively (young adults: $M = .66$, *CI:* .61 - .71; adults, $M = .62$, *CI*: .60 - .64; mature adults, $M = .53$, *CI*: .50 - .57).

Housing

Only 407 (49.8%) participants provided housing data. No main effect of housing was found for proportion of dark coats selected using a 3 x 8 mixed ANOVA, where housing was the

between-subjects variable (renting, living with family and owned their own house) and breed group was the within-subjects variable. A main effect of breed group emerged, $F(6.10, 2464.13) = 43.29$, $p < .001$. There was no significant interaction.

Country

A 2 x 8 mixed ANOVA did not find significant differences between American and Canadian participants in the proportion of dark coats selected for each breed group, nor was there an interaction between participant country and breed group. Only the consistent breed group effect emerged, $F(6.27, 5114.52) = 66.26$, $p < .001$.

Self-Identification

How participants self-identified (as either a dog or cat person, neither a dog or cat person or both a dog and cat person) was the between-subjects variable in a 4 x8 mixed ANOVA, where breed group was the within-subjects variable. No main effects of self-identification emerged for proportion of dark coats selected. Additionally, there was no interaction between self-identification and breed group. Again, only the main effect of breed group emerged, $F(6.26, 5091.50) = 30.91$, $p < .001$.

Dog Experience

Neither current nor previous dog ownership significantly influenced preferences for dark coats according to two separate 4 x 8 ANOVAs (one for current and one for previous experience) where dog ownership category (own none, one, two or three or more) were between-subject variables and breed group was the within-subjects variables. There were no significant interactions between breed group and either current or previous dog ownership. Only main

effects of breed group emerged, $F(6.27, 5094.14) = 61.38$, $p < .001$ and $F(6.26, 5085.49) = 51.08$, $p < .001$, respectively.

3.3.1.2.1.2 Source of Dog x Breed Group

To examine whether the proportion of photos selected indicated a preference for dark coats varied by source of dog and breed group, a mixed 3 x 8 mixed ANOVA was conducted, in which source of dog (shelter, congruent breeder and incongruent breeder) was the between-subjects variable and breed group (8 groups) was the within-subjects variable. There was a main effect of breed group, indicating that the breed groups differed significantly in proportion of dark coats preferred by participants, $F(6.26, 5098.60) = 24.80$, $p < .001$. See Figure 3.2. Post hoc analyses using Bonferroni correction revealed a dark coat preference for all but two breed groups: the Primitive/Spitz group, in which participants preferred light coats ($M = .45$, *CI*: .43 - .47), and the Herding group, for which there was no preference for either light or dark Coat Colours ($M = .50$, *CI*: .47 - .52), $t(817) = -5.49$, $p < .001$. A significant main effect of dog source also emerged, $F(2, 815) = 4.48$, $p < .013$, where participants in both the shelter and incongruent breeder conditions preferred dark-coated dogs, $M = .58$, *CI*: .56 - .59 and $M = .56$, *CI*: .54 - .58, respectively). No preference for coat colour emerged for the congruent breeder condition, $M = .50$, *CI*: .44 - .55. Breed group and source of dog did not interact.

In follow up analyses, data from online Newfoundland participants (NLers; $N = 76$), were analysed to determine whether this group of participants followed the same pattern of preferences as the other participants. A 3 x 8 mixed ANOVA, yielded no significant effects of dog source or breed group.

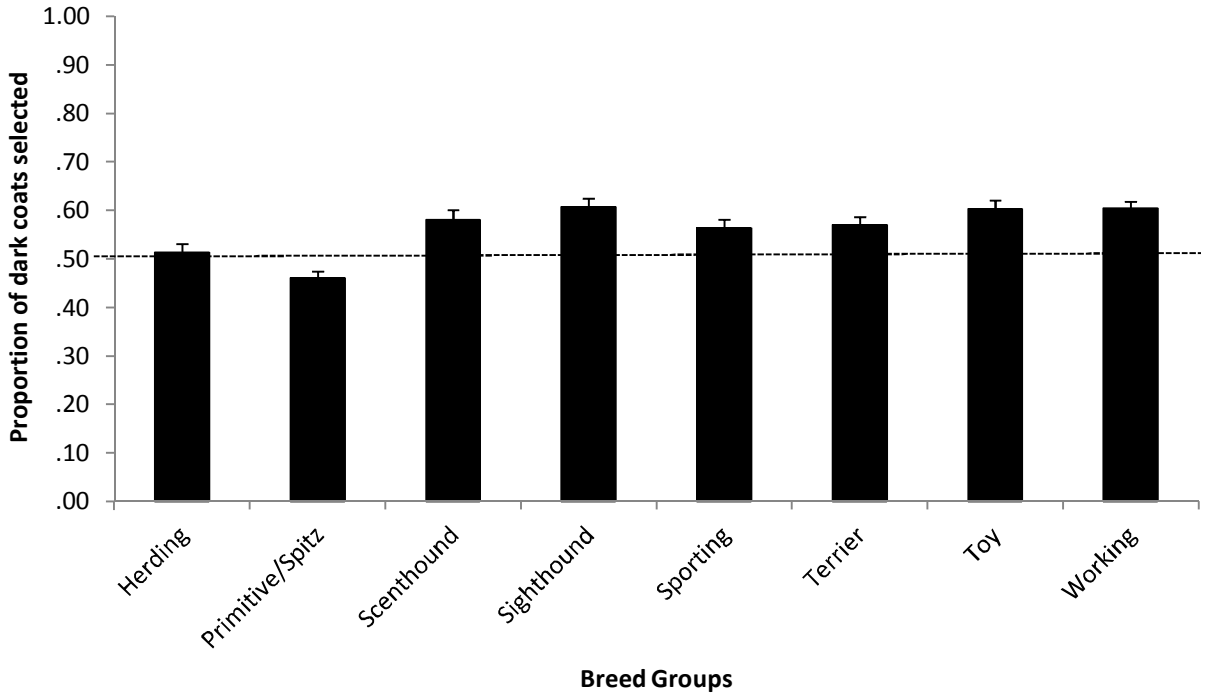


Figure 3.2. Proportion of selections indicating a Coat Colour preference for each breed group with error bars representing the 95% CI. The dotted line represents no preference such that bars above the dotted line represent a preference for dark coats and bars under the dotted line represent a preference for light coats. For all but the Herding group, participants showed a preference for either light coats (Primitive/Spitz) or dark coats (Scenthounds, Sighthounds, Sporting, Terrier, Toy and Working breed groups).

3.3.1.2.1.3 BBDS Awareness x Breed Groups

To examine whether preference for dark coats in specific breed groups was related to whether participants were aware of BBDS or not, a mixed 2 x 8 mixed ANOVA was conducted, where BBDS awareness (yes, no) was the between-subjects variable and breed group (8 groups) was the within-subjects variable. The results revealed main effects of BBDS awareness, $F(1, 816) = 11.00$, $p = .001$ and breed group, $F(6.27, 5115.14) = 55.78$, $p < .001$. BBDS aware

participants had a greater proportion of choices for dark-coated dogs than did BBDS unaware participants for each breed group. See Figure 3.3 below.

When only online participants from NL were analysed, no main effect of BBDS awareness emerged, nor did it interact significantly with breed groups.

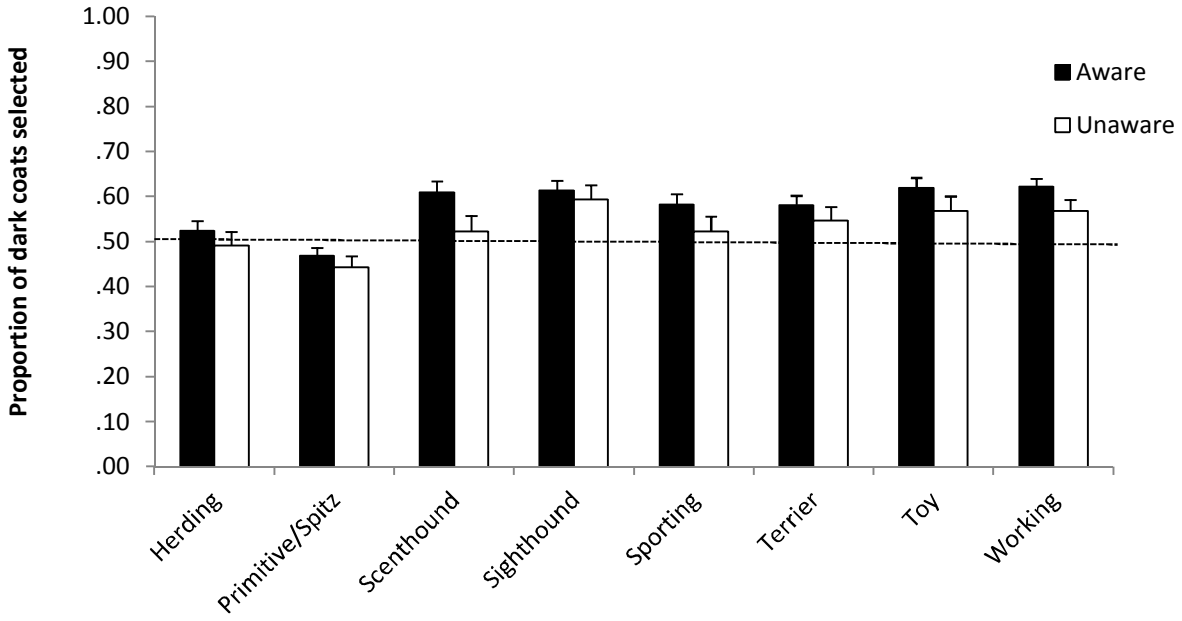


Figure 3.3. Mean proportion of selections indicating a preference for dark coats for each breed group, grouped by whether participants reported being aware of unaware of BBDS. Error bars represent 95% CIs. The dotted line represents no preference such that, bars above the dotted line represent a preference for dark coats and bars below the dotted line represent a preference for light coats.

3.3.1.2.1.4 BBDS Awareness x Source of Dog

To examine whether the proportion of dark coats selected from each of the three sources of dogs was related to whether participants were aware of BBDS or not, three 2 x 8 mixed ANOVAs were conducted. Each ANOVA examined BBDS awareness separately for each source of dog because of large differences in sample size between dog sources (shelter $N = 431$; breeder (congruent) $N = 47$; and breeder (incongruent) $N = 340$). BBDS awareness (yes, no) was the between-subjects variable and breed group (8) was the within-subjects variable.

Shelter

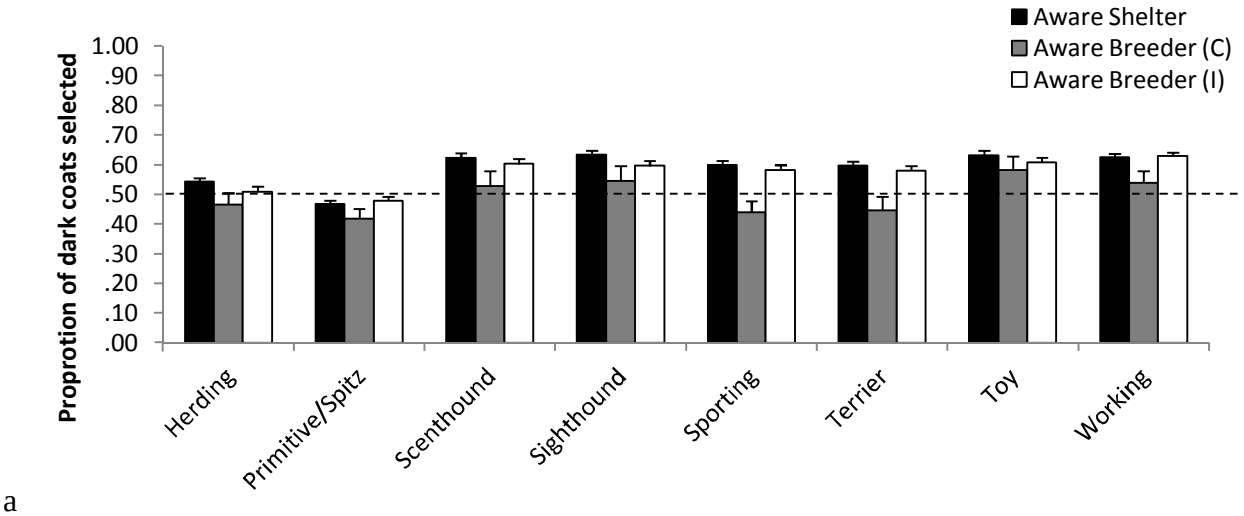
There was a main effect of breed group, indicating that the breed groups differed significantly in proportion of dark coats preferred, $F(6.34, 2719.64) = 36.26$, $p < .001$. See Figure 3.4. There was no main effect of BBDS awareness and no interaction.

Breeder (congruent)

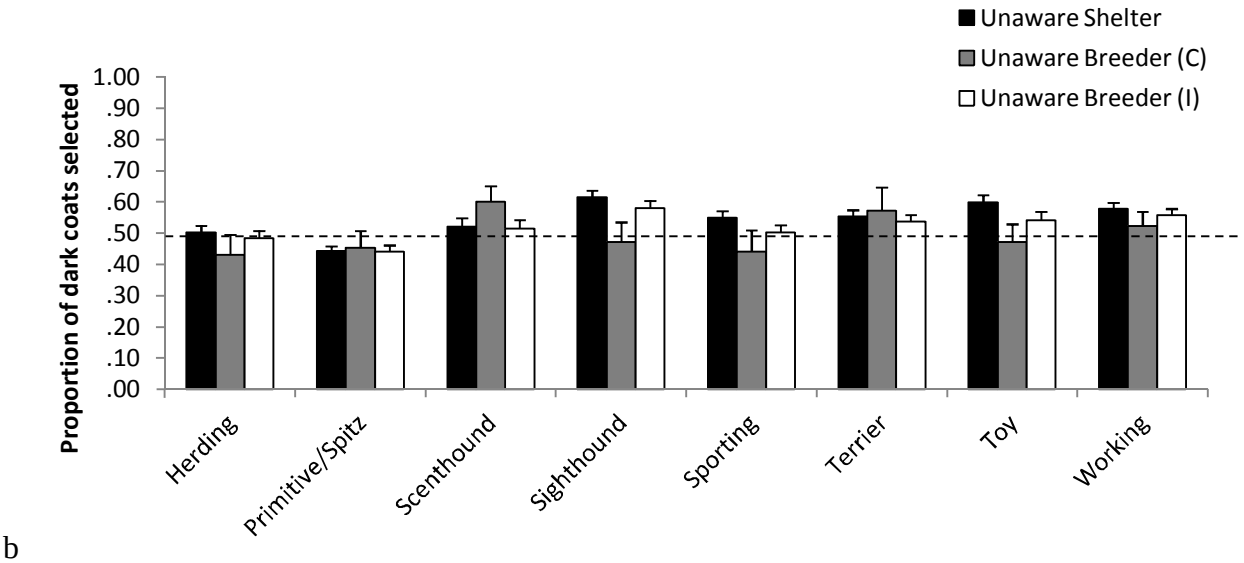
As shown in Figure 3.4, the 2 x 8 mixed ANOVA did not reveal a main effect of BBDS awareness for the breeder (congruent) condition. However, breed groups differed significantly in proportion of dark coats preferred, $F(7, 315) = 2.70$, $p < .01$. There was no significant interaction.

Breeder (incongruent)

Similar to the other conditions, breed groups differed significantly in proportion of dark coats preferred for the breeder (incongruent) condition, $F(5.86, 1981.28) = 19.87$, $p < .001$. See Figure 3.4. There was no effect of BBDS awareness and no significant interaction.



a



b

Figure 3.4. Proportion of selections indicating a preference for dark coats in each breed group for participants who reported that they were aware of BBDS (a) and for those that were unaware of BBDS (b) across all survey conditions. Error bars represent the 95% CI. The dotted line represents no preference such that, bars above the dotted line represent a preference for dark coats and bars below the dotted line represent a preference for light coats.

3.3.1.2.1.5 Culturally Significant Breeds

3.3.1.2.1.5.1 Source of Dog

To examine whether the proportion of dark coat selections for the culturally significant breeds varied by dog source, two 3 x 3 mixed ANOVAs were conducted (one ANOVA each for Labrador Retrievers and Newfoundland dogs), where source of dog (shelter, congruent breeder and incongruent breeder) was the between-subjects variable and Coat Colour comparison (3 comparisons: black vs. chocolate/brown, black vs. yellow/Landseer and chocolate/brown vs. yellow/Landseer) was the within-subjects variable. A dark preference was defined as a preference for the darker of the two coats involved in each comparison (i.e., if comparing a brown Newfoundland dog and Landseer, the brown Newfoundland dog would be considered dark; however, in a black vs. brown Newfoundland dog comparison, the black Newfoundland dog would be considered the dark coat).

Labrador Retriever

There was no significant main effect of dog source or interaction between dog source and Coat Colour. However, the ANOVA revealed a main effect of Coat Colour comparison, $F(1.58, 1290.81) = 36.05$, $p < .001$. Post hoc analyses revealed that each coat comparison differed significantly in terms of proportion of light or dark coats preferred. For the black vs. chocolate comparison, participants selected significantly more dark coats than they did for the black vs. yellow comparison, $t(1634) = 4.79$, $p < .001$, and the chocolate vs. yellow comparison, $t(1634) = 7.00$, $p < .001$ (estimated marginal means and 95% CIs reported below). Additionally, there was a significantly greater proportion of light coats selected for the chocolate vs. yellow comparison than for the black vs. yellow comparison, $t(1634) = 5.25$, $p = .001$. More notably however, only

two comparisons showed a significant difference in preferences for either the dark or light Coat Colour; in the black vs. chocolate comparison participants showed a clear preference for the black coat (M = .61, *CI*: .58 - .65), whereas for the chocolate vs. yellow comparison, they showed a light (yellow) coat preference (M = .42, *CI*: .38 - .45). There was no preference revealed for the black vs. yellow coat comparison (M = .52, *CI*: .49 - .56).

A similar preference pattern emerged when data from NLers were analysed separately, where there was a main effect of coat comparison, $F(1.52, 110.59) = 5.98$, $p < .008$. Post hoc analyses revealed a preference for the black coats (M = .63, *CI*: .52 - .74) when compared to chocolate. However, unlike in the non-NLer sample, no preference for the yellow coat (M: .39, *CI*: .28 - .50) emerged when compared to chocolate. The black vs. yellow coat comparison did not reveal a light or dark coat preference (M: .52, *CI*: .41 - .63). There was no significant main effect of dog source or interaction between variables.

Newfoundland Dog

Similar to the above analyses, there was no significant main effect of dog source or interaction between dog source and Coat Colour, but there was a main effect of Coat Colour comparison, $F(1.59, 1292.27) = 56.17$, $p < .001$. Post hoc analyses revealed that all three colour comparisons significantly differed in terms of proportion of dark coats that participants selected: for the black vs. brown comparison participants selected a greater proportion of dark coats than they did for the black vs. Landseer and brown vs. Landseer comparisons, $t(1634) = 7.74$, $p < .001$ and $t(1634) = 8.56$, $p < .001$, respectively. Additionally, for the brown vs. Landseer comparisons, participants selected a greater proportion of Landseer coats than they did for the black vs. Landseer comparison, $t(1634) = 3.18$, $p < .006$. The Landseer was preferred in all

comparisons in which it was an involved. However, when black and brown Newfoundland dogs were compared, the black coat was preferred. Estimated marginal means and 95% CI for all three comparisons were: black vs. brown, *M* = .61, *CI*: .58 - .64; black vs. Landseer, *M* = .43, *CI*: .39 - .47; brown vs. Landseer, *M* = .38, *CI*: .34 - .41).

When data from only NL participants was analysed, results differed in an interesting way: NLers preferred the black coats when black coats were an option, i.e. in both black vs. brown comparisons (*M* = .70, *CI*: .59 - .80) and black vs. Landseer comparisons (*M* = .66, *CI*: .53 - .79). The main effect of coat comparison remained, $F(1.57, 114.79) = 6.09$, $p < .007$, where a significantly greater proportion of dark coat selections were made for the black vs. Landseer comparison than for the brown vs. Landseer comparison, $t(150) = 3.70$, $p < .002$. When the pure black coat was not involved in the comparison, NLers did not show a preference for either the Landseer or the brown coat (*M* = .46, *CI*: .35- .57).

3.3.1.2.1.5.2 Participant Location

To examine whether the proportion of dark coat selections for the culturally significant breeds were influenced by participant location, two mixed ANOVAs were conducted separately for Labrador Retrievers and the Newfoundland dog. The first of these ANOVAs examined differences between participants from the US and Canada in a 2 x 3 mixed ANOVA, where country (US, Canada) was the between-subjects variable and Coat Colour comparison (3) was the within-subjects variable. The second set of ANOVAs (mixed 2 x 4) examined Coat Colour preferences for the culturally significant breeds using Canadian geographic regions (4 regions), as the between-subject variable and Coat Colour comparison (3), as the within-subjects variable.

Labrador Retriever

There was no main effect of country or interaction between country and Coat Colour comparison. There was a main effect of colour comparison, $F(1.58, 1291.30) = 95.36$, $p < .001$ where in the black vs. chocolate comparison a significantly greater proportion of dark coats were selected by participants than were for either the black vs. yellow or chocolate vs. yellow comparisons, $t(1634) = 6.31$, $p < .001$, and $t(1634) = 10.89$, $p < .001$, respectively. The black vs. yellow comparison also had a significantly greater proportion of dark coats selected than the chocolate vs. yellow comparison, $t(1634) = 9.54$, $p < .001$. Black coats were preferred when they were involved in the comparison: black vs. chocolate and black vs. yellow comparisons, $M = .63$, *CI*: .61 - .66 and $M = .55$, *CI*: .53 - .58, respectively. Only when black was not included in the Coat Colour comparison for Labrador Retrievers (i.e. the chocolate vs. yellow comparison), was the lighter (yellow) coat preferred ($M = .43$, *CI*: .40 - .45).

In the ANOVA investigating the effect of regions of Canada on participant preferences, neither main effect of region nor any interaction between region and Coat Colour emerged. However, there was a main effect of Coat Colour comparison, $F(1.61, 772.67) = 47.92$, $p < .001$. Post hoc analyses revealed a similar pattern as described above: a significantly greater proportion of dark coats were selected for the black vs. chocolate comparison than for the black vs. yellow and the chocolate vs. yellow comparisons, $t(966) = 4.70$, $p < .001$ and $t(966) = 7.86$, $p < .001$, respectively. Furthermore, for the black vs. yellow comparison, participants showed a greater selection of light coats than they did for the chocolate vs. yellow comparison, $t(966) = 6.63$, $p < .001$. Interestingly, however, a black coat preference emerged for the black vs. chocolate comparison ($M = .62$, *CI*: .59 - .66) whereas a light coat colour preference emerged for the chocolate vs. yellow coat comparison ($M = .40$, *CI*: .37 - .44). No preference emerged for the

black vs. yellow comparison (M = .53, CI: .49 - .57). These preferences differed slightly from the overall North American sample described in the previous paragraph.

Newfoundland Dog

The results of the country analysis revealed no interaction between country and Coat Colour, nor was there a main effect of country. However, there was a main effect of Coat Colour comparison, $F(1.59, 1294.63) = 140.25$, $p < .001$. A significantly greater proportion of dark coats were selected for the black vs. brown comparison than for either the black vs. Landseer or brown vs. Landseer comparisons, $t(1634) = 12.33$, $p < .001$ and $t(1634) = 13.22$, $p < 13.22$, $p < .001$, respectively. Furthermore, in the brown vs. Landseer comparison participants showed a greater preference for the lighter Landseer coat than they did for the black vs. Landseer comparison, $t(1634) = 4.82$, $p < .001$. The estimated marginal means and 95% CIs reveal that participants preferred the black Newfoundland dog when compared to the brown-coated Newfoundland (M = .61, CI: .58 - .63). However, the Landseer was preferred to the black and brown-coated Newfoundland dogs in the other two comparisons (M = .42, CI: .39 - .45 and M = .37, CI: .34 - .39, respectively).

The analysis investigating possible preference differences between Canadian regions revealed a main effect of region, $F(3, 480) = 11.22$, $p < .001$ and coat comparison, $F(1.54, 736.93) = 35.43$, $p < .001$ which were qualified by a significant interaction, $F(1.97, 4.61) = 3.72$, $p < .004$. In both comparisons involving black coats, NLers showed a preference for the black coats (black vs. brown: M = .71, CI: .65 -.78 and black vs. Landseer: M = .62, CI: .54 - .70). In the remaining comparison, brown vs. Landseer, NLers did not show a preference for either coat. Central Canadians also did not reveal a preference for either coat whereas participants from

Western and Maritimes regions selected a greater proportion of Landseer coats (*M* = .42, *CI*: .36-.48 and *M* = .34, *CI*: .30 - .38, respectively). Maritimersô preference for the Landseer remained when compared to the brown coat (*M* = .38, *CI*: .33 - .42). Participants from Central Canada showed similar preferences, *M* = .38, *CI*: .29 - .48). In black vs. brown comparison, Maritimersô shared their preference with NLers for the black-coated Newfoundland dog, *M* = .60, *CI*: .57 - .64).

3.3.1.2.1.5.3 BBDS Awareness

To examine whether the proportion of dark coat selections for the culturally significant breeds were influenced by whether participants were aware of BBDS or not, two mixed 2 x 3 mixed ANOVAs were conducted, where awareness of BBDS was the between-subjects variable and Coat Colour comparison was the within-subjects variable.

Labrador Retriever

There was a main effect of BBDS awareness, such that those who were aware of BBDS preferred a greater proportion of dark coats (*M* = .55, *CI*: .53 - .57) than participants who were unaware of BBDS, who showed no preference (*M* = .49, *CI*: .47 - .52), $F(1, 816) = 12.31$, $p < .001$. There was also a main effect of colour comparison, $F(1.58, 1292.57) = 75.09$, $p < .001$, where each Coat Colour comparison differed significantly from the others in terms of proportion of dark coats selected: the black vs. chocolate comparison showed a significant black coat preference (*M* = .62, *CI*: .60 - .64) compared to the black vs. yellow comparison, the latter of which did not reveal a real preference for either coat colour (*M* = .53, *CI*: .50 - .55), $t(10) = 6.77$, $p < .001$. The black vs. chocolate comparison was significantly different than the chocolate vs. yellow comparison, where participants in the latter showed a significant preference for yellow

coats (*M* = .42, *CI*: .40 - .45), *t*(10) = 10.16, *p*< .001. Participantôs selection in the chocolate vs. yellow comparison's proportion was also significantly different from that for the black vs. yellow comparison, *t*(10) = 7.50, *p* < .001. These main effects were qualified by a significant interaction, *F*(1.58, 1292.57) = 5.80, *p*= .006. As can be seen in Figure 3.5a, BBDS aware participants preferred more dark coats only when black was an option. In the comparison not involving a black coat (i.e., chocolate vs. yellow), there was no difference in the preference showed by BBDS aware and non-aware participants.

When data from online NLers only were analysed, there was a main effect of BBDS awareness where BBDS aware participants selected a greater proportion of dark coats than did BBDS unaware participants, *F*(1, 74) = 5.15, *p* < .027, (*M* = .57, *CI*: .50 - .63 and *M* = .45, *CI*: .37 - .52, respectively). There was also a main effect of coat colour comparison, *F*(1.51, 112.05) = 9.62, *p* = .001 where the chocolate vs. yellow comparison differed significantly from the black vs. chocolate and black vs. yellow comparisons in terms of proportion of light coats that participants selected, *t*(150) = 3.49, *p* < .003 and *t*(150) = 3.08 = *p* < .010, respectively. NLers preferred black and yellow coats when compared to chocolate coats (*M* = .60, *CI*: .53 - .67 and *M* = .40, *CI*: .33 - .48, respectively), however there was no preference when given the choice between black and yellow coats (*M* = .51, *CI*: .44 - .59). There was no significant interaction.

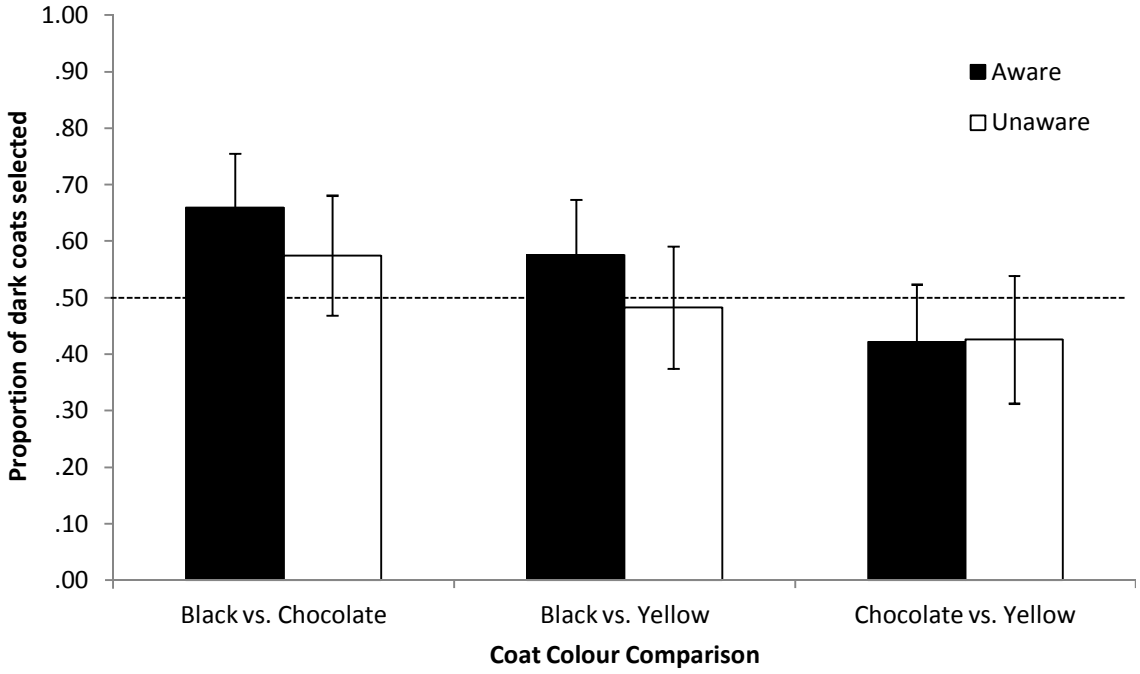


Figure 3.5a. Proportion of selections indicating a dark coat preference for BBDS aware and unaware participants for the Labrador Retriever. Error bars represent the 95% CI. The dotted line represents no preference such that, bars above the dotted line represent a preference for dark coats and bars below the dotted line represent a preference for light coats.

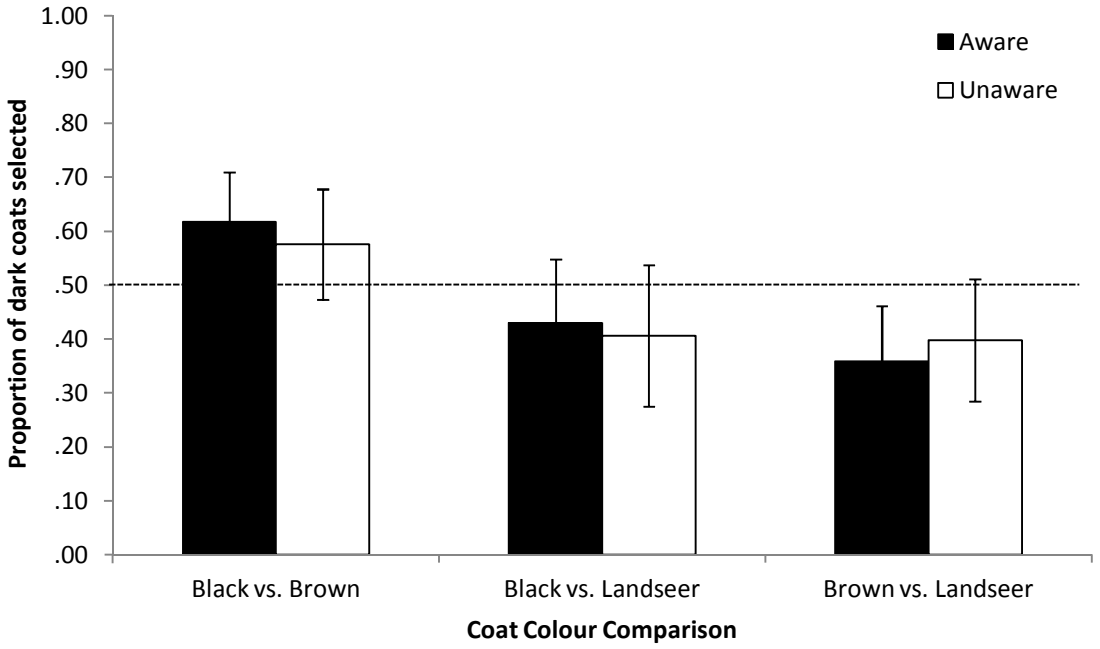


Figure 3.5b. Proportion of selections indicating a dark coat preference for BBDS aware and unaware participants for the Newfoundland dog. Error bars represent the 95% CI. The dotted line represents no preference such that, bars above the dotted line represent a preference for dark coats and bars below the dotted line represent a preference for light coats.

Newfoundland Dog

There was no interaction between BBDS awareness and Coat Colour preferences for Newfoundland dogs, nor was there a main effect of BBDS awareness. However, there was a significant main effect of colour comparison, $F(1.58, 1292.54) = 109.71$, $p < .001$. Post hoc analyses revealed, as can be seen in Fig. 3.5b, that each Coat Colour comparison received significantly different preference proportions (black vs. brown: $t(1634) = 11.13$, $p < .001$; black vs. Landseer: $t(1634) = 11.47$, $p < 001$ and brown vs. Landseer: $t(1634) = 3.33$, $p < .003$). The

black-coated Newfoundland dog was preferred to the brown-coated Newfoundland (*M*= .60, *CI*: .58 - .62), however, when the Landseer was involved in the comparisons, it was preferred (vs. black: *M* = .42, *CI*: .39 - .44 and when compared to the brown coat: *M* = .38, *CI*: .35 - .40).

When data from NLers were analysed, neither main effect of BBDS awareness nor any interaction emerged. However, the significant main effect of the colour comparison remained, $F(1.59, 117.64) = 10.95$, $p < .001$, where the brown vs. Landseer comparison received different preference proportions than both the black vs. brown and black vs. Landseer comparisons, $t(150) = 3.95$, $p < .002$. NLers preferred black coats over both the brown and Landseer coats, *M* = .70, *CI*: .63 - .77 and *M* = .61, *CI*: .53 - .70, respectively. When given the choice between the brown and Landseer coat, NLers did not have a preference (*M* = .48, *CI*: .40 - .55).

3.3.1.2.2 Coat Type Preferences

To examine the relationship between participant demographics and coat type preferences, six mixed ANOVAs were conducted (one for each of the following demographic variables: sex, age, housing, country, self-identification and dog experience, i.e., number of current and previous dogs owned). In all ANOVAs, a consistent significant breed group effect was found, reported and described in more detail below in regards to each analysis (see Figure 3.6).

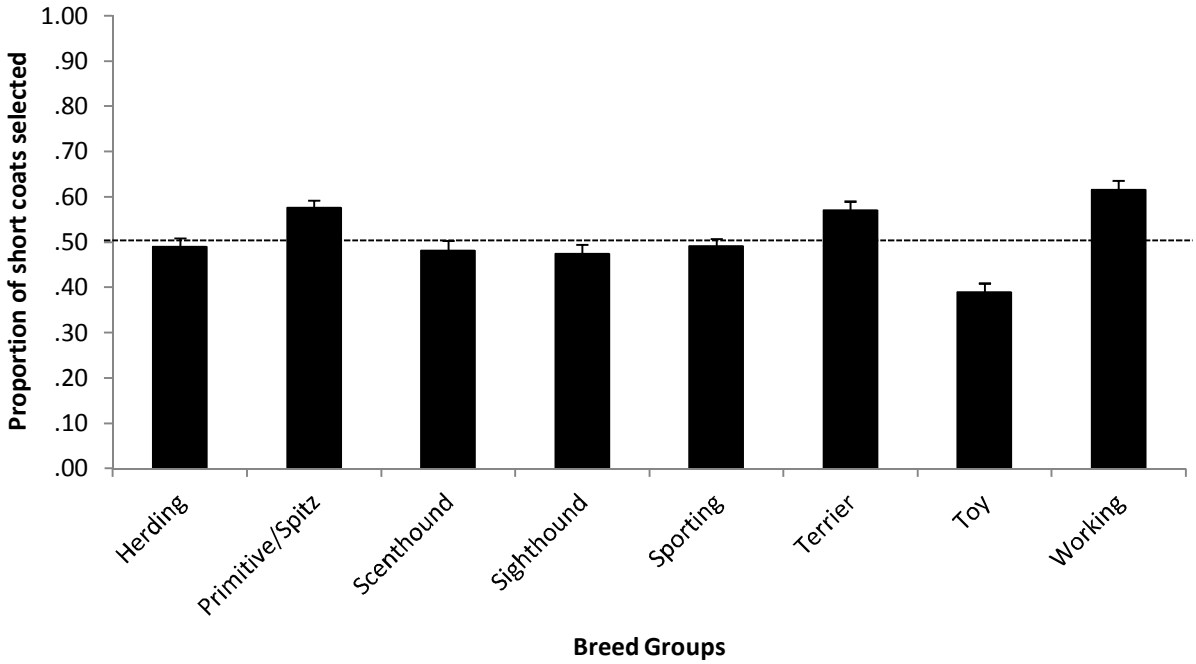


Figure 3.6. Proportion of selections indicating a short coat preference across all eight breed groups. Error bars represent the 95% CI. The dotted line represents no preference such that, bars above the dotted line represent a preference for short coats and bars below the dotted line represent a preference for long coats.

3.3.1.2.2.1 Participant Demographics

Sex & Age

A 2 x 8 mixed ANOVA where participant sex was the between-subjects variable and breed group was the within-subjects variable, no main effects of participant sex emerged. A main effect of breed group, however, did emerge, $F(5.83, 4754.63) = 34.19$, $p < .001$, see Figure 3.6.

In a 3 x 8 mixed ANOVA where participant age (young adult, adult, mature adult) was the between-subjects factor and breed group was the within-subjects factor, a significant main effect of breed group emerged for proportion of short coats preferred, $F(5.89. 4800.98) = 62.30$,

$p < .001$ (see Figure 3.6). There was a clear Coat Type preference for five breed groups: three breeds groups - Primitive/Spitz, Terrier and Working were preferred with short coats ($M = 56$, *CI*: .54 - .59; $M = .58$, *CI*: .56 - .61; and $M = .60$, *CI*: .58 - .63, respectively). The Sighthound and Toy breed groups were preferred with long coats ($M = .47$, *CI*: .45 - .49 and $M = .40$, *CI*: .37 - .42, respectively). These main effects were qualified by a significant age x breed group interaction, $F(11.78, 4800.98) = 5.45$, $p < .001$, where young adults preferred long coats for the Terrier, Toy and Scenthound breed groups, and mature adults preferred short coats for the same groups.

Housing

A 3 x 8 mixed ANOVA where housing category (renting, living with family or owning own house) was the between-subjects variable and breed group was the within-subjects variable revealed a main effect of breed group on proportion of short coats preferred, $F(5.73, 2314.50) = 42.36$, $p < .001$. This effect was qualified by a significant housing category x breed group interaction, $F(11.46, 2314.50) = 2.76$, $p < .002$ (see Figure 3.7). For two breed groups, the Primitive/Spitz group and Working group, renters and participants owning their own house showed overall preferences for short coats (Primitive/Spitz: $M = .58$, *CI*: .53 - .63 and $M = .63$, *CI*: .60 - .67 respectively; Working: $M = .59$, *CI*: .53 - .64 and $M = .62$, *CI*: .58 - .66, respectively) whereas participants living with family showed no preference for either coat type for both breed groups: $M = .54$, *CI*: .49 - .59 and $M = .55$, *CI*: .49 - .61, respectively. See Figure 3.7.

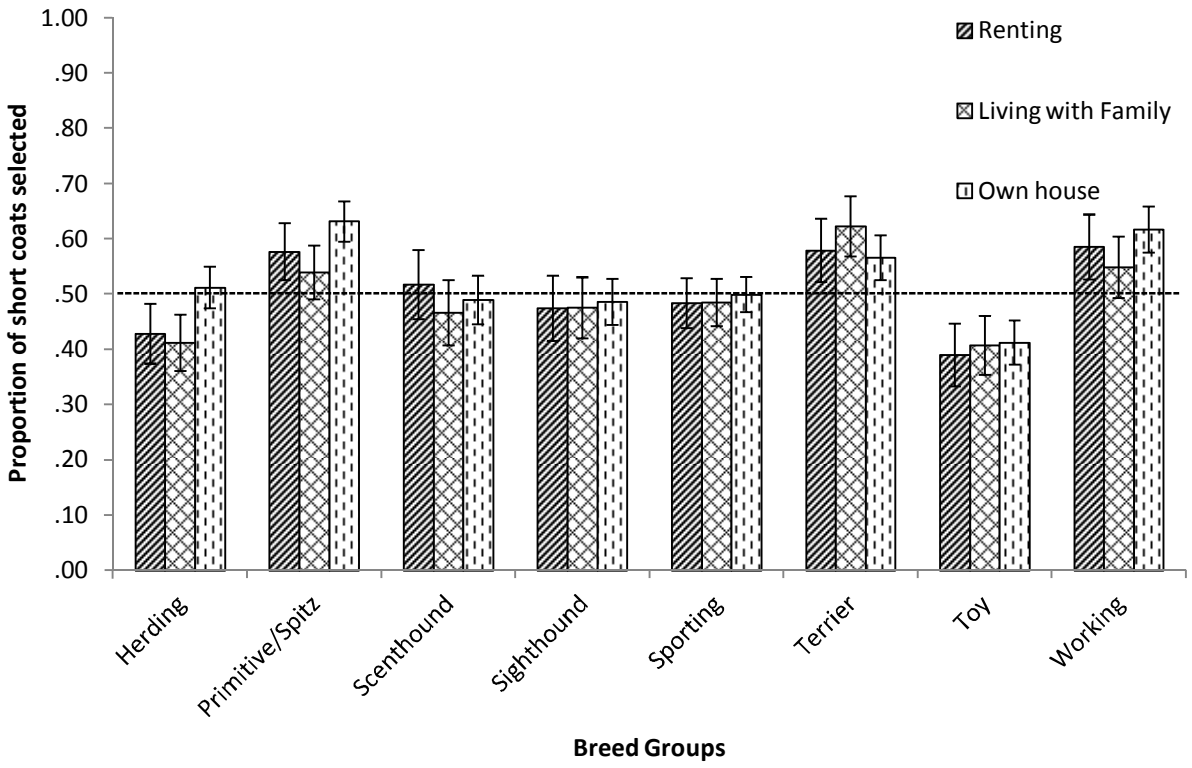


Figure 3.7. Proportion of selections indicating a short coat preference across for participants in different housing situations. Error bars represent the 95% CI. The dotted line represents no preference such that, bars above the dotted line represent a preference for short coats and bars below the dotted line represent a preference for long coats.

Country

Based on 2 x 8 mixed ANOVA where participantsô country was the between-subjects variable and breed group was the within-subjects variable, there was no main effect of country, such that Americans and Canadians did not differ in their preferences. A main effect of breed group did emerge, $F(5.85, 4776.10) = 101.14$, $p < .001$ (similar to that shown in Figure 3.6), as well as a significant participant country x breed group interaction, $F(5.85, 4776.10) = 4.24$, $p <$

.001. Canadians showed little to no preference for long coats in the Herding breed group compared to the little to no preference for short coats showed by Americans for the same group (*M* = .47, *CI*: .45 - .50 and *M* = .52, *CI*: .49 - .55, respectively). Americans also showed a stronger preference for short coats in the Primitive/Spitz (*M* = .60, *CI*: .58 - .63) and Working breed groups (*M* = .66, *CI*: .63 - .69) than Canadians (Primitive/Spitz: *M* = .56, *CI* = .54 - .58; Working: *M* = .59, *CI*: .56 - .61, respectively). The pattern for colour preference was reversed, however, for the Terrier breed group where American participants showed a stronger preference for long coats than Canadian participants, *M* = .56, *CI*: .53 - .59 and *M* = .58, *CI*: .55 - .60, respectively). See Figure 3.8.

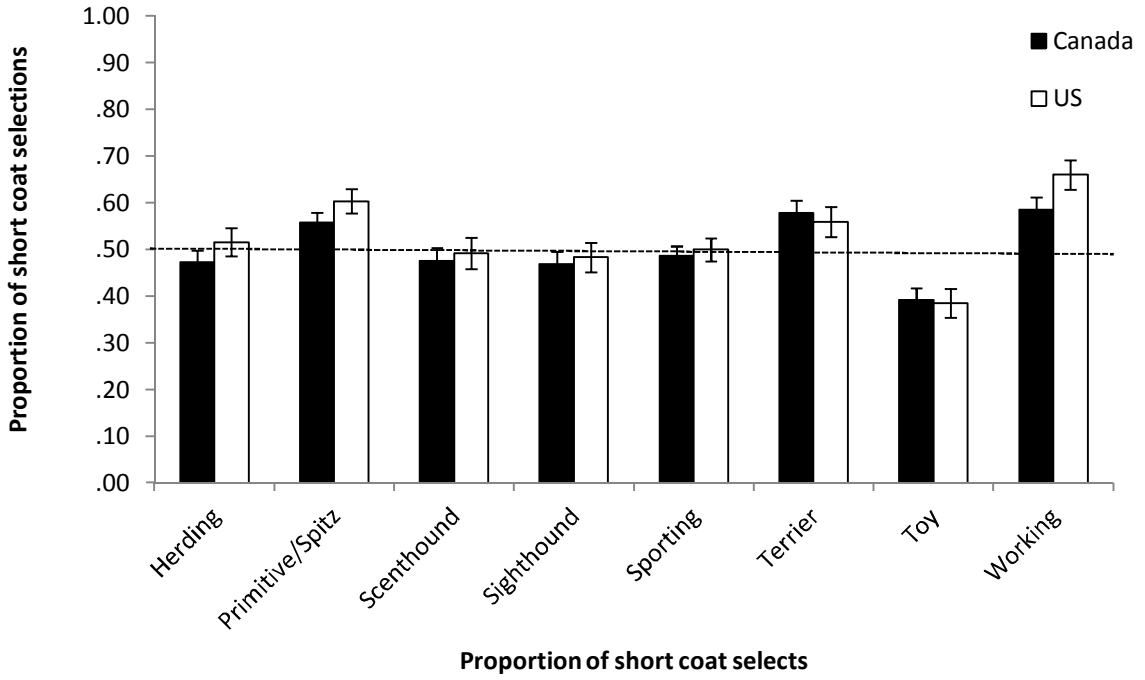


Figure 3.8. Proportion of selections indicating a short coat preference for Canadian and US participants. Error bars represent the 95% CI. The dotted line represents no preference such that, bars above the dotted line represent a preference for short coats and bars below the dotted line represent a preference for long coats.

Self-Identification

A 4 x 8 mixed ANOVA where self-identification (dog person, cat person, both a dog and cat person, neither a dog or cat person) was the between-subjects variable and breed group was the within-subjects variable was carried out. A main effect of self-identification emerged, $F(3, 813) = 7.74, < .001$. Post hoc analyses using Bonferroni's correction revealed that participants who self-identified as a dog person made a greater proportion of long coat preference selections than participants who identified themselves as neither cat and/nor dog people, $t(560) = 4.16$, $p <$

.001 (dog: *M* = .54, *CI*: .52 - .56; neither: *M* = .49, *CI*: .43 - .50). A main effect of breed group emerged as described in Fig 3.6. No significant interaction emerged.

Dog Experience

Two 4 x 8 mixed ANOVAs were conducted where number of dogs currently or previously owned were the between-subjects variable and breed group was the within-subjects variable. The first ANOVA showed that participants' current number of dogs had a significant main effect, $F(3, 813) = 4.20$, $p = .006$ such that participants who reported currently owning no dogs had a significantly lower proportion of short coat selections than participants who reported owning two dogs, $t(336) = 3.41$, $p < .006$. Participants that currently did not own any dogs were the only group to show a preference for long coats (*M* = .46, *CI*: .43 - .49). In contrast, participants who owned two dogs showed a preference for short coats (*M* = .54, *CI*: .51 - .56). The other two participant groups, owning a single dog or at least three, showed no preference for either short or long coats (*M* = .51, *CI*: .49 - .53 and *M* = 52, *CI*: .50 - .55, respectively). The consistent main effect of breed group remained, see Figure 3.9.

The second 4 x 8 mixed ANOVA where previous number of dogs owned was the between subjects variable and breed group was the within-subjects variable revealed only a significant main effect of breed group for proportion of short coats preferred, $F(5.83, 4736.47) = 64.61$, $p < .001$. The pattern for preferences was similar to those shown in Figure 3.9.

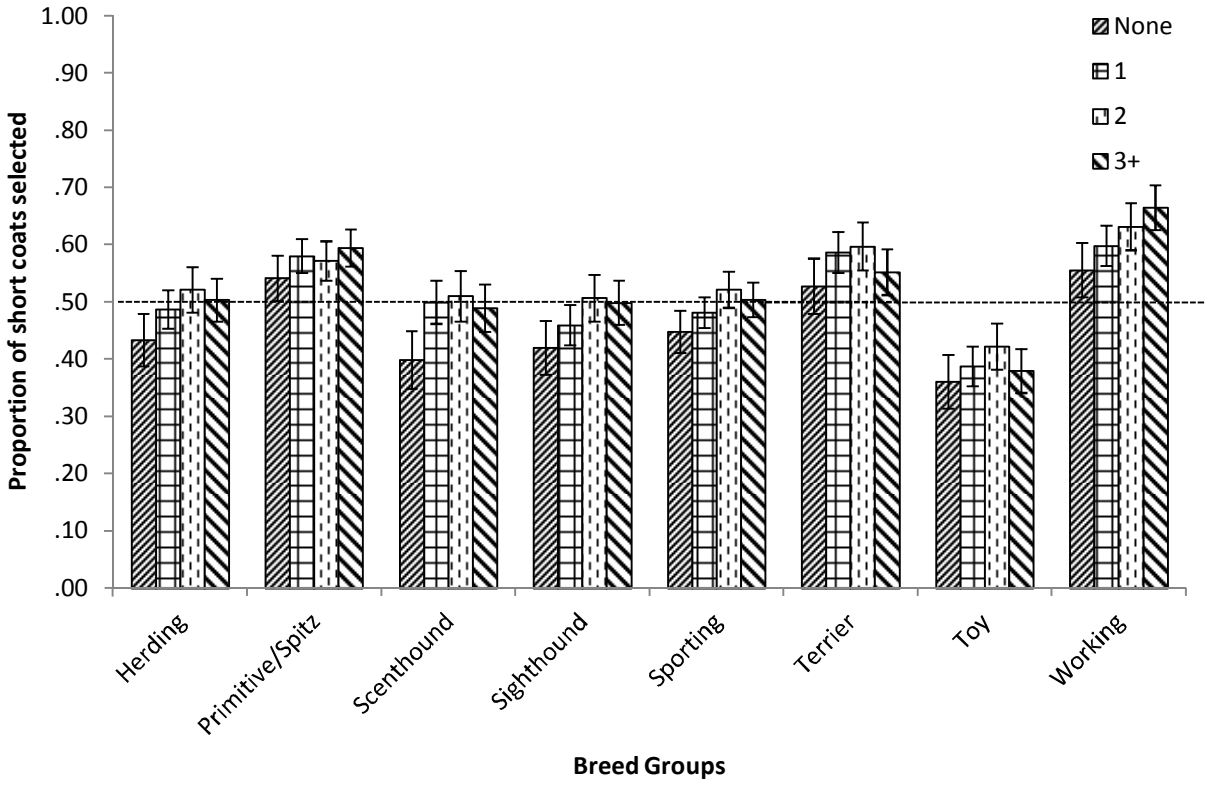


Figure 3.9. Proportion of selections indicating a short coat preferences across breed groups for participants that currently owned 0-3+ dogs. Error bars represent 95% CI. The dotted line represents no preference such that, bars above the dotted line represent a preference for short coats and bars below the dotted line represent a preference for long coats.

3.3.1.2.2.2 Source of Dog x Breed Group

To examine whether the proportion of selections indicating a preference for short coats varied by source of dog and breed group, a mixed 3 x 8 mixed ANOVA was conducted, where source of dog (shelter, congruent breeder and incongruent breeder) was a between-subjects variable and breed group (8 groups) was the within-subjects variable. The results revealed the

main effect of breed group indicating that the breed groups differed significantly in proportion of short coats preferred, $F(5.83, 4752.45) = 50.85$, $p < .001$ similar to the proportions represented in Figure 3.9 above. There was no main effect of dog source or any dog source x breed group interaction.

The same analyses using data only from NLers again revealed a main effect of breed group, $F(5.38, 392.46) = 6.09$, $p < .001$ (see Figure 3.10). No main effect of dog source emerged, however there was a significant interaction between dog source and breed group, $F(10.75, 392.46) = 2.40$, $p < .008$. Participants in the shelter condition preferred more long coats for both the Herding and Sighthound breed groups ($M = .37$, *CI*: .27 - .46 and $M = .38$, *CI*: .28 - .47, respectively) than those either in the congruent breeder (Herding: $M = .50$, *CI*: .25 - .76; Sighthound: $M = .56$, *CI*: .31 - .81) or incongruent breeder (Herding: $M = .49$ *CI*: .40 .59; Sighthound: $M = .51$, *CI*: .42 - .61) conditions. Furthermore, participants in the congruent breeder condition preferred more short-coated Working breeds ($M = .85$, *CI*: .61 - 1.0) than did those in the shelter condition ($M = .54$, *CI*: .46 -.63) and incongruent breeder condition ($M = .53$, *CI*: .44 - .62). See Figure 3.10.

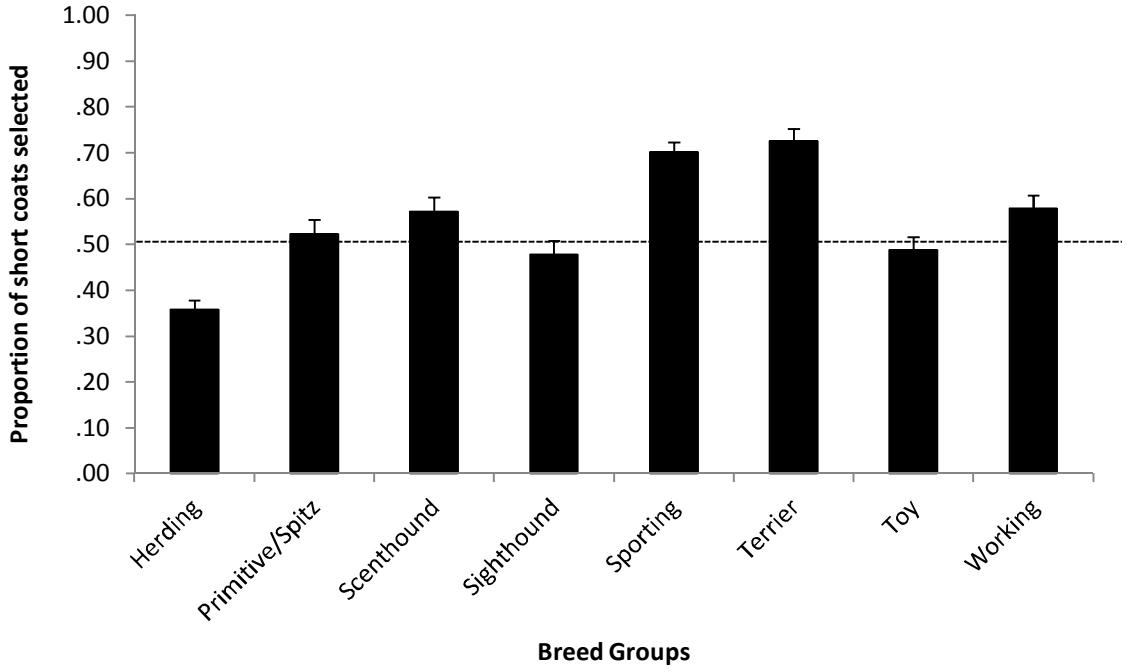


Figure 3.10. Proportion of selections indicating a short coat preference for online NLers. Error bars represent the 95% CI. The dotted line represents no preference such that, bars above the dotted line represent a preference for short coats and bars below the dotted line represent a preference for long coats.

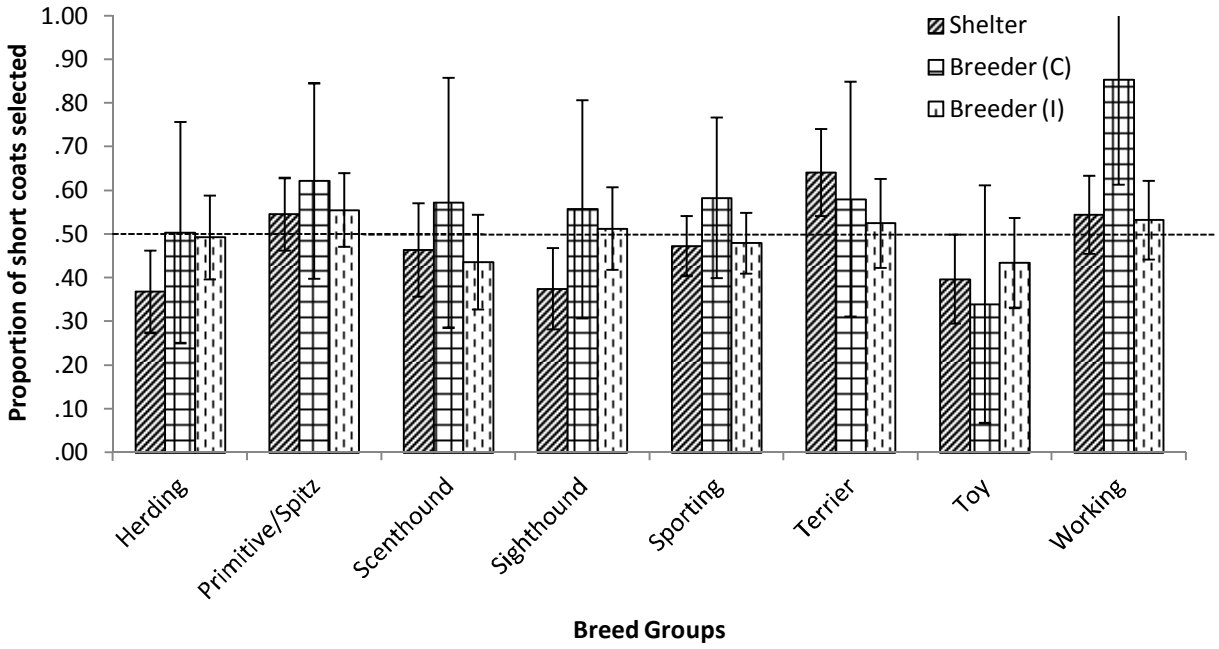


Figure 3.11. Proportion of selections indicating a short coat preference for online NL participants across dog source conditions. Error bars represent the 95% CI. The dotted line represents no preference such that, bars above the dotted line represent a preference for short coats and bars below the dotted line represent a preference for long coats.

3.3.1.2.2.3 BBDS Awareness x Breed Group

Although BBDS does not directly speak to coat type preferences, it is possible that "long haired/fluffy" dogs can appear larger than a specimen of the same breed with a smooth coat. This speaks to whether it is *big* black dog syndrome rather than just a colour phenomenon (i.e. black dog bias). Thus, to examine whether the proportion of selections that indicated a preference for short coats for specific breed groups was related to whether participants were aware of BBDS or not, a mixed 2 x 8 mixed ANOVA was conducted, where BBDS awareness (yes, no) was the

between-subjects variable and breed group (8 groups) was the within-subjects variable. The results revealed a main effect of breed group remained, $F(5.84, 4761.63) = 84.67$, $p < .001$. There was no main effect of BBDS awareness, nor did these variables did not interact.

When the data from participants from NL were analysed, no main effect of BBDS awareness emerged, nor did it interact significant with breed groups. The main effect of breed group however remained, $F(5.38, 403.21) = 8.36$, $p < .001$

3.3.1.2.2.4 BBDS Awareness x Source of Dog

To examine whether the proportion of selections that indicated a preference for short coats in each of the three sources of dogs were related to whether participants were aware of BBDS or not, three 2 x 8 mixed ANOVAs were conducted. Each ANOVA examined BBDS awareness separately for each source of dog because of large differences in sample size between dog sources (shelter $N = 431$; breeder (congruent) $N = 47$; and breeder (incongruent) $N = 340$). BBDS awareness (yes, no) was a between-subjects variable and breed group (8) was a within-subjects variable.

Shelter

The ANOVA revealed a main effect of BBDS awareness $F(1, 429) = 11.13$, $p = .001$, such that participants who were aware of BBDS chose a greater proportion of short coats than participants who were not aware of BBDS, the latter of which showed no overall preference (M =.56,*CI*: .53 - .60 and $M = .49$, *CI*: .47 - .52, respectively). This was mediated by a significant interaction effect, $F(5.98, 2563.39) = 43.58$, $p < .001$, where unaware participants selected a greater proportion of short coats for each breed group, however the strength of this preference

varied significantly by breed group as can be seen below in Figure 3.12. Additionally, as always, there was a main effect of breed group, $F(5.98, 2563.39) = 43.58$, $p < .001$.

Breeder (congruent)

The ANOVA did not reveal a main effect of BBDS awareness. However, breed groups differed significantly in proportion of short coats preferred, $F(5.04, 226.91) = 11.08$, $p < .001$, with participants showing a similar, but slightly weaker, preference for short coats for all groups. There was no significant interaction.

Breeder (incongruent)

Unlike the shelter condition, this ANOVA did not reveal main effect of BBDS awareness. However, the breed group effect remained, $F(5.63, 1904.40) = 32.65$, $p < .001$, with participants showing short coat preferences similar to those in the other conditions. There was no interaction between these variables.

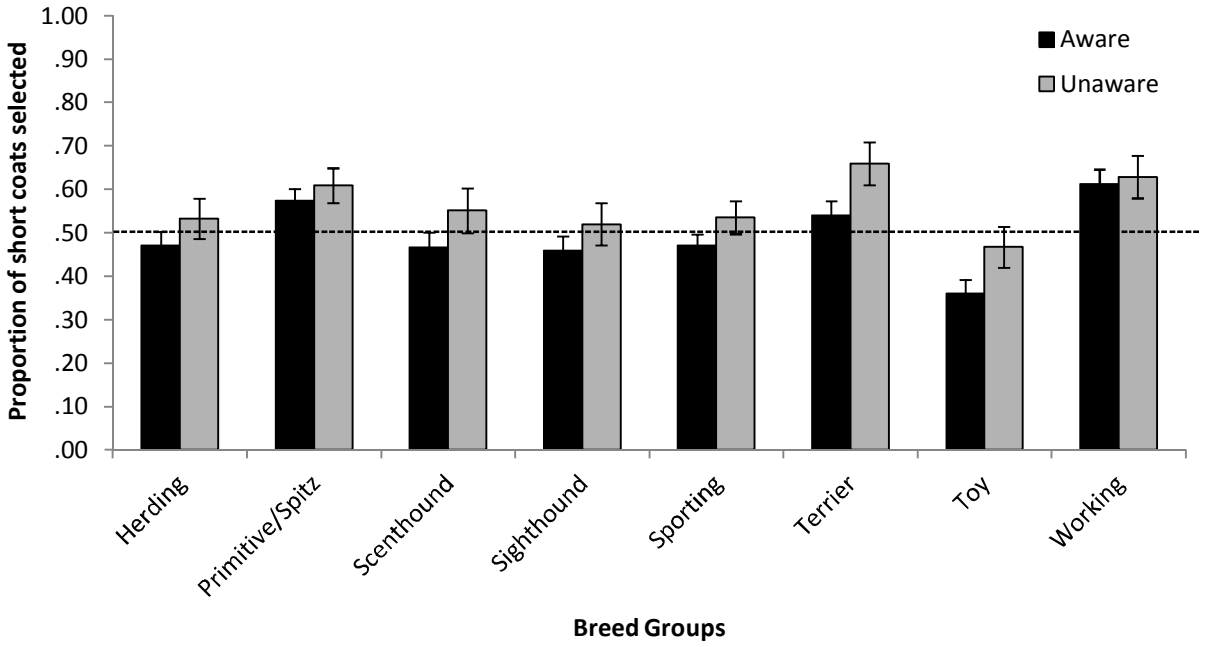


Figure 3.12. Proportion of selections indicating a short coat preference for BBDS aware and unaware participants in the Shelter condition. Error bars represent the 95% CI. The dotted line represents no preference such that, bars above the dotted line represent a preference for short coats and bars below the dotted line represent a preference for long coats.

Online Study Result Summary

Coat Colour

In summary, participants in the online study were quite familiar with dogs, as evident by most reporting currently (82.3%) and previously (86.9%) owning a dog as well as being self-described dog people (49.9% with another 25.6% self-identified as both a cat and dog person). Additionally, the majority (67.6%) of participants reported being aware of BBDS, though significantly more US participants (83.5%) did so than those living in Canada (56.6%). There

was, however, no participant location effects on dog preferences; Canadian and American participants reported overall similar coat colour preferences.

Breed group almost always emerged as a main effect for all analyses of Coat Colour. This indicates that the breeds used to represent the breed groups in this study influenced the participantsô coat colour preferences. Specifically, the Primitive/Spitz group was preferred with a light coat. Participants showed no significant preference for either colour for the Herding breed group, whereas participants showed a significant preference for dark coat colours for the remaining six breed groups examined. Additionally, participants with BBDS awareness, except NLers, selected more dark coats than those who reported being unaware of the concept.

A few interesting differences emerged when colour preferences for the culturally significant breeds, the Labrador Retriever and Newfoundland dog, were examined. For the Labrador Retriever, the black coat was preferred over the chocolate coat when all online participant data was examined. The preference held when only NLer data were examined. Additionally, the yellow Labrador Retrievers were preferred over the chocolate Labs for online participants. The preference was not quite as strong when only NL participants were examined. Only when all online participant data were analysed did a slight preference for the black coat emerge over the yellow coat. When only NL data were analysed, no preference emerged. No other main effects of participant location (US vs. Canada or Canadian region) emerged for this breed. However, BBDS awareness did significantly predict a greater selection of Labrador Retriever black coats when they were involved in a comparison; this awareness however did not predict a greater selection of chocolate coats when compared to the yellow-coated Labs. While this might suggest that BBDS aware participants may be compensating for the bias by

consciously selecting black-coated dogs, it is unclear why this occurred with Labrador Retrievers and not Newfoundland dogs.

Indeed, the Landseer, which has a mixed black and white coat, was preferred by online participants when it was an option. In the remaining comparison between the black and the brown coated Newfoundland dogs, the black coat was preferred. Participants from Newfoundland, however, differed: they showed a significantly stronger preference for black coats when they were an option (vs. brown and vs. Landseer). When the black coat was not involved (brown vs. black and white Landseer), NLers did not show a preference for the Landseer. Unlike for the Labrador Retriever, the Canadian regions differed in preferences for the Newfoundland dog: as stated above, NLers reported stronger dark coat preferences, Maritimers showed light coat preferences and the other two regions (Central and Western Canada) did not show either a dark or light coat preference.

Coat Type

Preferences for coat types were not as related to BBDS as those for coat colour; however, some interesting results were found. Participants that self-identified as a Dog Person tended to prefer more long-coated dogs than participants that self-identified as neither a dog or cat person. Furthermore, participants who reported currently owning two dogs also selected a greater proportion of long coats than participants who reported not owning a dog. In fact, only participants that did not currently own a dog preferred short coats.

Interestingly, knowledge of BBDS was a significant predictor of coat type selections for participants in the Shelter condition; BBDS aware participants showed a preference for long coats whereas no preference emerged in either of the Breeder conditions. It is possible that those

aware of BBDS were more sensitive to any factor that they could perceive as negatively influencing the probability of adoption from a shelter for particular dogs, including coat type.

3.3.2 On-Campus Study

The on-campus study was included so that statistical comparisons between a large online sample and a smaller group, tested under more controlled conditions, could be examined. The online sample was broader in terms of age and living conditions (see descriptive statistics below) and was more likely to be recruited through their interest and involvement in the canine community whereas students that participated in the on-campus study may have also been interested in dogs, but also received a small monetary incentive.

3.3.2.1. Descriptive Statistics

A total of 73 undergraduate and graduate students completed the study at Memorial University of Newfoundland. Demographic information was collected at the end of the study. Thirty-seven participants completed the shelter condition; the remaining 36 completed the breeder condition. No participants chose to withdraw from the study.

3.3.2.1.1. Participants

Location

Most of the sample (N = 43, 58.9%) was born in Newfoundland and Labrador and reported being raised in the province (64.4%). When asked to specify how long they have lived in the province, most participants (N = 64, 87.7%) responded they that had lived in NL for 2+ years, seven (9.6%) indicated that had been residents for 1-2 years, one participant (1.4%)

reported living in the province for 6 months -1 year, and one (1.4%) reported being a resident for 1 - 6 months.

Sex and Age

Most of the participants were females (*N* = 58, 79.5%) and were in the young adult age category (*N* = 65, 89%), whereas the remaining 11% were in the adult life stage. There were no participants in the mature age category.

Housing

The most common housing situation was renting an apartment or house (*N* = 34, 46.6%) followed by living with family (*N* = 27, 37%), living in dormitory/residence (*N* = 10, 13.7%) and owning own house (*N* = 1, 1.4%). One participant indicated "other" but did not specify their current housing situation.

Self Identification

Half (*N* = 36, 49.3%) of the participants self-identified as primarily a dog person, 23 (31.5%) identified themselves as both a cat and dog person, ten (13.7%) identified themselves as primarily a cat person, and the remaining three (4.1%) identified as neither.

Dog Experience

The majority of the sample indicated that they did not currently own a dog (*N* = 48, 65.8%). A quarter of the sample (*N* = 18, 24.7%) reported currently owning one dog, four (5.5%) reported owning two dogs and three participants (4.1%) reported owning three or more dogs. When asked about previous dog ownership, 33 (45.2%) reported that they had not previously

owned a dog, 20 (27.4%) reported that they had previously owned one dog, 9 (12.3%) had previously owned two dogs, and 11 (15.1%) had previously owned three or more.

BBDS Awareness

Unlike for the online study, the majority of the on-campus participants was not aware of BBDS (*N* = 58, 80.6%); only 14 (19.4%) reported that they had heard that black dogs were less likely to be adopted than lighter-coated dogs. One participant did not respond.

Dog Knowledge

Accuracy scores for dog knowledge ranged from 20% to 95% with the overall mean accuracy (±*SEM*) of 67.1% ±1.9%.

3.3.2.2 Preference Statistics

3.3.2.2.1 Coat Colour Preferences

3.3.2.2.1.1 Participant Demographics

To examine the relationship between participant demographics and Coat Colour preferences, six mixed ANOVAs were conducted (one for each of the following demographic variables: sex, age, housing, self-identification and dog experience, i.e., number of current and previous dogs owned). A consistent significant breed group effect was found (F values are presented below) in each of the following analyses. A less conservative alpha value of 5% will be used to distinguish significant results from non-significant results for the on-campus component (vs. the alpha value of 1% for the online component) of this study due to the noticeable difference in sample size between the two participant groups (online: *N* = 818; on-campus: *N* = 73). To examine the aforementioned breed group effect more closely, a one-way

ANOVA in which breed group was the independent variable and proportion of dark coats selected was the dependent variable, was conducted. The ANOVA revealed a main effect of breed group, F (5.79, 416.63) = 10.89, p < 001. Specifically, for the Scenthound and Sighthound groups, participants showed a preference for dark coats (M = .57, *CI*: .51 - .64 and M = .64, *CI*: .58 - .70, respectively). Additionally, for the Toy and Sporting breed groups, participants showed little to no preference for dark coats (M = .56, *CI*: .50 - .63 and M = .56, *CI*: .50 - .62, respectively). Only for the Primitive/Spitz group did participants show a preference for light coats (M = .43, *CI*: .39 - .46). No preferences emerged for the Herding, Terrier and Working breed groups (M = .47, *CI*: .41 - .53; M = .53, *CI*: .47 - .58; and M = .49, *CI*: .43 - .54, respectively). See Figure 3.13.

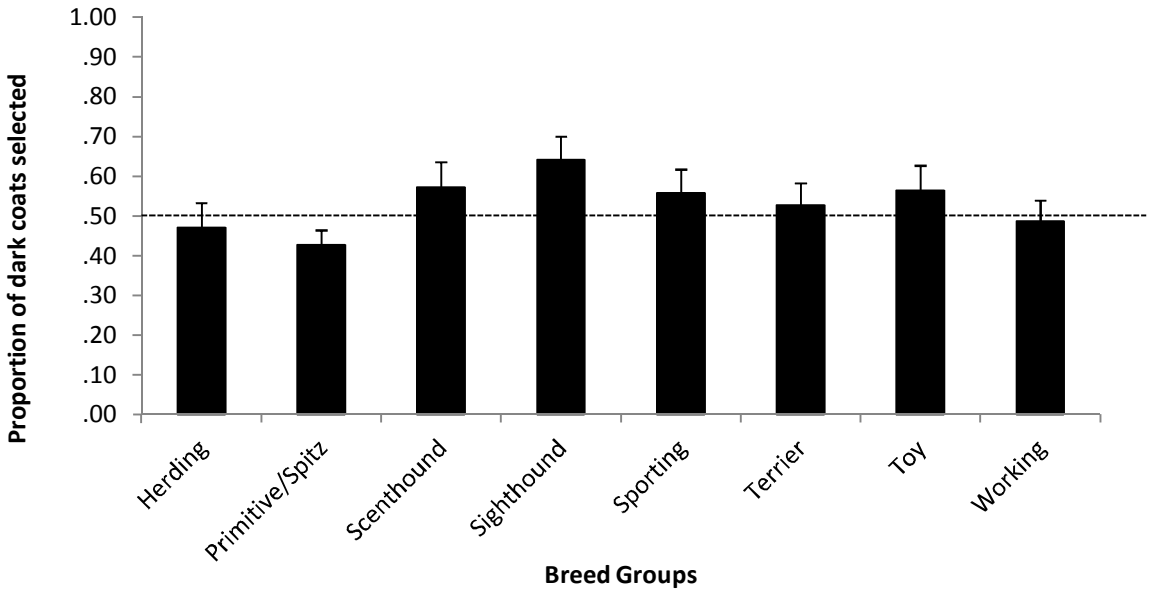


Figure 3.13. Proportion of on-campus selections indicating a dark coat preference across breed groups. Error bars represent the 95% CI. The dotted represents no preference such that, bars above the dotted line represent a dark coat preference and bars below the dotted line represent a light coat preference.

Sex

A 2 x 8 ANOVA, in which sex was the between subjects variable and breed group (8 groups) was the within-subjects variable, was conducted. There was a significant main effect of breed group on proportion of dark coats preferred, $F(5.81, 412.16) = 5.89$, $p < .001$. The test did not reveal a main effect of participant sex, nor was there an interaction effect of sex and breed group on proportion of short coats preferred.

Age

A 2 x 8 ANOVA, where age was the between subjects variable (young adult and adult, there were no mature adults in the on-campus sample) and breed group was a within-subjects variable was conducted. A main effect of breed group emerged, $F(5.77.\ 409.68) = 6.03$, $p < .001$. There was no main effect of age or any interaction.

Housing

One participant did not supply housing information. A 4 x 8 ANOVA was conducted on the data from the remaining 72 participants, with housing the between-subjects variable (4 groups) and breed group the within-subjects variable. The consistent effect of breed group emerged once again, $F(5.74, 390.35) = 3.45$, $p < .04$, No significant main effect of housing or interaction between housing and breed group was found Coat Colour preferences.

Self-Identification

How participants self-identified (dog person, cat person, neither a dog or cat person or both a dog and cat person) did not significantly affect preferences for Coat Colour. Additionally, there was no significant interaction.

Dog Experience

Neither current nor previous dog ownership significantly influenced Coat Colour preferences, however, the main effect of breed group remained for both the current and previous dog ownership ANOVAs, $F(5.80, 399) = 6.22$, $p < .001$ and $F(5.75, 396.96) = 8.41$, $p < .001$, respectively. There were no significant interactions.

3.3.2.2.1.2 Dog Source and Breed Group

To examine whether the proportion of selections that indicated a preference for dark coats varied by source of dog and breed group, a mixed 2 x 8 mixed ANOVA was conducted, where source of dog (shelter and breeder) was the between-subjects variable and breed groups (8) was the within-subjects variable. The results revealed there was a main effect of breed group, $F(5.75, 408.09) = 10.85$, $p < .001$; however there was no effect of dog source, nor did these variables interact.

3.3.2.2.1.3 BBDS Awareness and Breed Groups

To examine whether the proportion of selections that indicated a preference for dark coats for specific breed groups were related to whether participants were aware of BBDS or not, a mixed 2 x 8 mixed ANOVA was conducted, where BBDS awareness (yes, no) was the between-subjects variable and breed group (8 groups) was the within-subjects variable. The results revealed no main effect of BBDS awareness; however, as usual, there was a main effect of breed group, where groups differed significantly from each other in proportion of dark coats preferred, $F(5.69, 398.32) = 4.93$, $p < .001$. There was no interaction between these two variables. These results should be interpreted cautiously as only 19% of the on-campus sample reported being aware of BBDS.

3.3.2.2.1.4 BBDS Awareness and Dog Source

This analysis was not performed as neither the main effects of BBDS awareness, or dog source, were statistically significant in the on-campus sample.

3.3.2.2.1.5 Culturally Significant Breeds

3.3.2.2.1.5.1 Source of Dog

To examine whether the proportion of dark coat selections for the culturally significant breeds varied by dog source, two mixed 2 x 3 ANOVA were conducted (one for Labrador Retrievers and one for the Newfoundland dog), where dog source (shelter, breeder) was the between-subjects variable and Coat Colour comparison (black vs. chocolate/brown, black vs. yellow/Landseer, chocolate/brown vs. yellow/Landseer) was the within-subjects variable. For each coat comparison, a dark preference was defined as a preference for the darker of the two coats involved.

Labrador Retriever

No main effects of Coat Colour comparison or dog source were obtained. Additionally, there was no significant interaction between these variables.

Newfoundland Dog

No main effects of comparison or dog source were observed, nor did these variables interact.

3.3.2.2.2 Coat Type Preferences

To examine the relationship between participant demographics and coat type preferences, six mixed ANOVAs were conducted (one for each of the following demographic variables: sex, age, housing, self-identification, and dog experience, i.e. number of current and previous dogs owned). In all the following ANOVAs, a consistent significant breed group effect was found, $p < .001$, as reported in the following subsections. A one-way ANOVA, in which proportion of short

coats preferred was the independent variable, revealed that the Herding breed group was preferred with long coats (M =.36, CI: .32 - .40) whereas Scenthounds, Sporting breeds, Terriers and Working breeds were preferred with short coats: M = .57, CI: .51 - .64; M = .70, CI: .66 - .75; M = .73, CI: .67 - .78 and M = .58, CI: .52 - .64, respectively, see Figure 3.14.

3.3.2.2.2.1 Source of Dog x Breed Group

To examine whether the proportion of selections that indicated a preference for short coats varied by source of dog and breed group, a 2 x 8 mixed ANOVA was conducted, where source of dog (shelter vs. breeder) was the between-subjects variable and breed groups (8 groups) was the within-subjects variable. The results revealed that there was only a main effect of breed group indicating that the breed groups differed significantly in proportion of short coats preferred, $F(5.31, 377.29) = 30.59$, $p < .001$. See Figure 3.14.

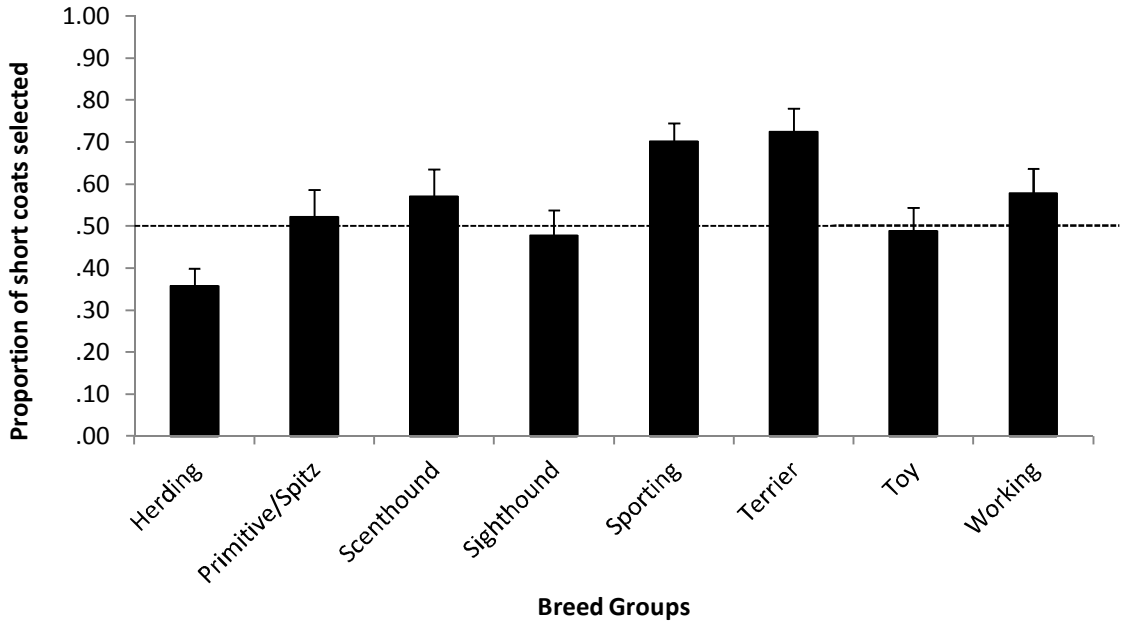


Figure 3.14. Proportion of selections indicating a short coat preference across breed groups for on-campus participants. Error bars represent the 95% CI. The dotted line represents no preference such that, bars above the dotted line represent a preference for short coats and bars below the dotted line represent a preference for long coats.

3.3.2.2.2.2 BBDS Awareness x Breed Groups

To examine whether the proportion of selections that indicated a preference for short coats for specific breed groups was related to whether participants were aware of BBDS or not, a mixed 2 x 8 mixed ANOVA was conducted, where BBDS awareness (yes, no) was the between-subjects variable and breed group (8 groups) was the within-subjects variable. The results revealed no main effect of BBDS awareness. The main effect of breed group remained, $F(5.22, 365.35) = 14.74$, $p < .001$. These variables did not interact to influence proportion of short-coated dog preferences. Again, the results must be interpreted cautiously due to the small size of the sample that reported being aware of BBDS (19%).

3.3.3 Comparing online and on-campus Newfoundland participants

3.3.3.1. Descriptive Statistics

A similar number of NLers completed the study online and on-campus (N = 76 for online and N = 73 for on-campus), theoretically allowing for an interesting comparison of preferences to be made between NLers that completed the study via the two methods, providing insight into the pro and cons of online research methods vs. more traditional laboratory methods. It is important to note, however, that these two participant groups differed significantly in several demographic variables. Additionally, and unfortunately, due to the wording error (incongruent Breeder condition), only 5 online NL participants completed the corrected (congruent Breeder condition) version of the online study; 35 completed the incorrect wording version before it was corrected. Because of this low sample size, effects of dog source must be interpreted cautiously. In contrast, 36 of the on-campus participants completed the correct Breeder condition. Similar numbers of from both samples (online: N = 36 and on-campus: N = 37) completed the Shelter condition.

3.3.3.1.1 Participants

Sex & Age

There were similar proportions of males and females in both the online and on-campus groups. Both groups, however, had a greater female representation than males (88.2% for the online group and 74.9% for the on-campus group).

The two groups did differ in terms of age, G^2 (2, N = 149) = 78.38, $p < .001$, where the on-campus sample was composed of a greater number of young adults (N = 65), fewer adults (N

= 8) and no mature adults. In comparison, the online sample was composed mostly of adults (*N*= 46) as well as young (*N* = 13) and mature adults (*N* = 17).

Housing

As mentioned previously, only about half (*N* = 41, 53.9%) of the online NL participants provided information regarding their housing situation. Using the data provided, a chi square analysis revealed a significant difference in housing situations between the online and on-campus participant groups. The greater proportion of the online group reported owning their own home (51.2% vs. .01%) whereas greater proportions in the latter group reported renting (47.2% vs. 19.5%) and living with family (37.5% vs. 29.3%).

Self Identification

A chi square revealed that the two groups of participants did not differ significantly in terms of how they self-identified as a dog person, a cat person, neither a dog or cat person or both a dog and cat person. Both groups were primarily composed of dog persons (online: 53.9%; on-campus: 49.3%), followed by both dog and cat persons (online: 36.8%; on-campus: 31.9%). Only 9.2% and 13.9% of online and on-campus participants self-identified as cat persons, respectively. The remaining participants, 4.2% of the on-campus sample, identified as neither a dog or cat persons. No online participants self-identified as neither a dog or cat person.

Dog Experience

Participants differed in dog experience in terms of current and previous number of dogs owned, χ^2 (3, *N* = 149) = 20.89, $p < .001$ and χ^2 (3, *N* = 149) = 19.94, $p < .001$, respectively. The on-campus participants were more likely to report not owning a dog, 65.8% vs. 31.6% for online.

They were also less likely to own one, two or three or more dogs (24.7%, 5.5% and 4.1%, respectively) than online participants (32.9%, 18.4% and 17.1%, respectively).

A similar pattern was found for the number of previously owned dogs; more on-campus participants reported never owning a dog (45.2%) than online participants (16.0%). The on-campus participants also reported having owned fewer dogs: one (27.4%), two (12.3%) and three or more (15.1%) than the online group: one (24.0%), two (21.3%) and three or more (38.7%).

BBDS Awareness

A greater proportion of the online participants reported being aware of BBDS (55.3%) than the on-campus participants (19.4%), χ^2 (1, N = 148) = 20.17, p < .001.

Dog Knowledge

The on-campus participants scored better on the Breed Identification task than online participants, $t(147) = 2.54$, $p < .013$. The mean accuracy score for the on-campus group was .67 (*SEM* = .043) and .55 (*SEM* = .019) for the online group.

3.3.3.2 Preferences Statistics

3.3.3.2.1 Coat Colour Preferences

To investigate whether online and on-campus participants had similar coat colour preferences, a 2 x 8 mixed ANOVA was conducted, where participant group (online and on-campus) was the between-subjects variable and breed groups (8) was the within-subjects variable. The results revealed a main effect of breed group, $F(6.18, 907.67) = 13.83$, $p < .001$, where most of the breed groups (5) were preferred with dark coats: Scenthound M =.56, CI = .51 - .60; Sighthound M = .62, CI = .57 - .66; Sporting M = .56, CI = .51 - .60; Terrier M = .55, CI = .51 - .59; and Toy M = .57, CI = .52 - .61. Participants showed a light coat preference for only

one breed group, the Primitive/Spitz (*M* = .44, *CI* = .41 - .47). The remaining two breed groups, the Herding and Working groups, were not preferred in either coat colour, *M* = .50, *CI* = .46 - .54 and *M* = .53, *CI* = .50 - .57, respectively. This effect was qualified by a significant breed group x participant group interaction, $F(6.18, 907.67) = 2.83$, $p < .010$. Online participants generally preferred more dark coats to varying degrees than on-campus participants, except for the Scenthounds and Sighthound breed group. See Fig 3.15.

3.3.3.2.1.1 Dog Source and Breed Group

Because of the large discrepancies in the number of online participants that completed the correct Breeder condition (*N* = 5 vs. on-campus: *N* = 36 ï most online participants completed the incongruent breed condition, *N* = 35), two separate mixed 2 x 8 mixed ANOVAs were conducted; one for online participants and one for on-campus participants, where source of dog (shelter and congruent breeder) was the between-subjects variable and breed groups (8) was the within-subjects variable (incongruent breed data was excluded from the online participant analyses because on-campus participants were never exposed to the wording error that led to the condition). The results revealed only a main effect of breed group, $F(5.75, 408.09) = 10.85$, $p < .001$ for on-campus participants. No effect of dog source or interaction emerged for either participant group.

3.3.3.2.1.2 BBDS Awareness and Breed Groups

To examine whether the proportion of selections that indicated a preference for dark coats for specific breed groups were related to whether participants were aware of BBDS or not, a 2 x 2 x 8 mixed ANOVA was conducted, where BBDS awareness (yes, no) and participant group (online, on-campus) were between-subjects variables and breed group (8 groups) was the

within-subjects variable. The main effect of breed group for group, $F(6.12, 881.58) = 8.85$, $p < .001$, emerged again as well as a significant three way BBDS awareness x participant group x breed group interaction, $F(6.12, 881.58) = 2.81$, $p < .011$. This interaction is represented graphically below in Fig. 3.16. BBDS unaware online participants tended to show a greater preference for dark-coated dogs than on-campus participants. Additionally, within each breed group, online and on-campus participants showed different degrees of preference, e.g. BBDS aware online participants preferred more dark coats for the Primitive/Spitz, Sporting and Toy breed groups than BBDS unaware online participants. BBDS unaware on-campus participants showed a greater preference for dark-coated Sporting breeds than BBDS aware on-campus participants; however the pattern was reversed for Toy breeds, where BDS aware on-campus participants selected a greater number of dark coats than unaware participants.

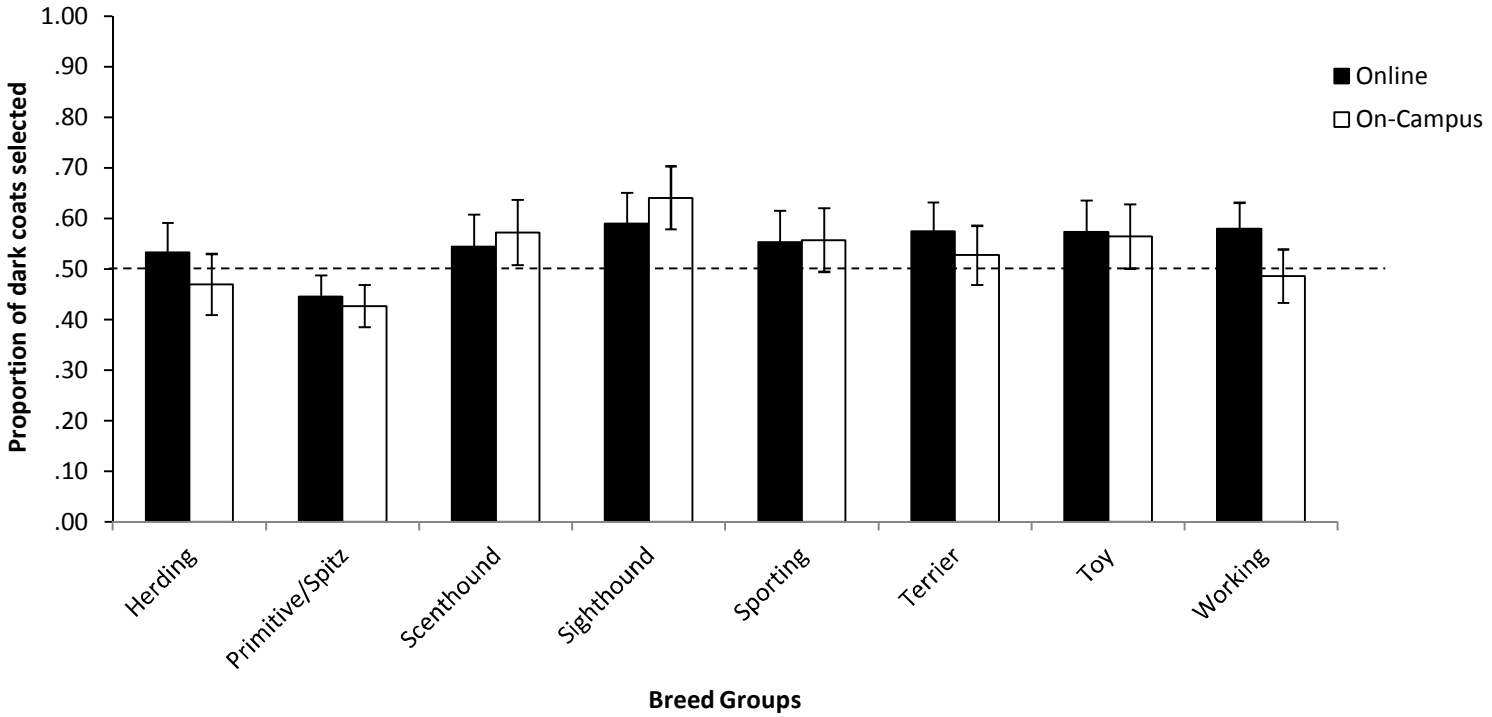


Figure 3.15. Proportion of selections indicating a dark coat preference across breed groups for online and on-campus participants. Error bars represent the 95% CI. The dotted line represents no preference such that, bars above the dotted line represent a preference for dark coats and bars below the dotted line represent a preference for light coats.

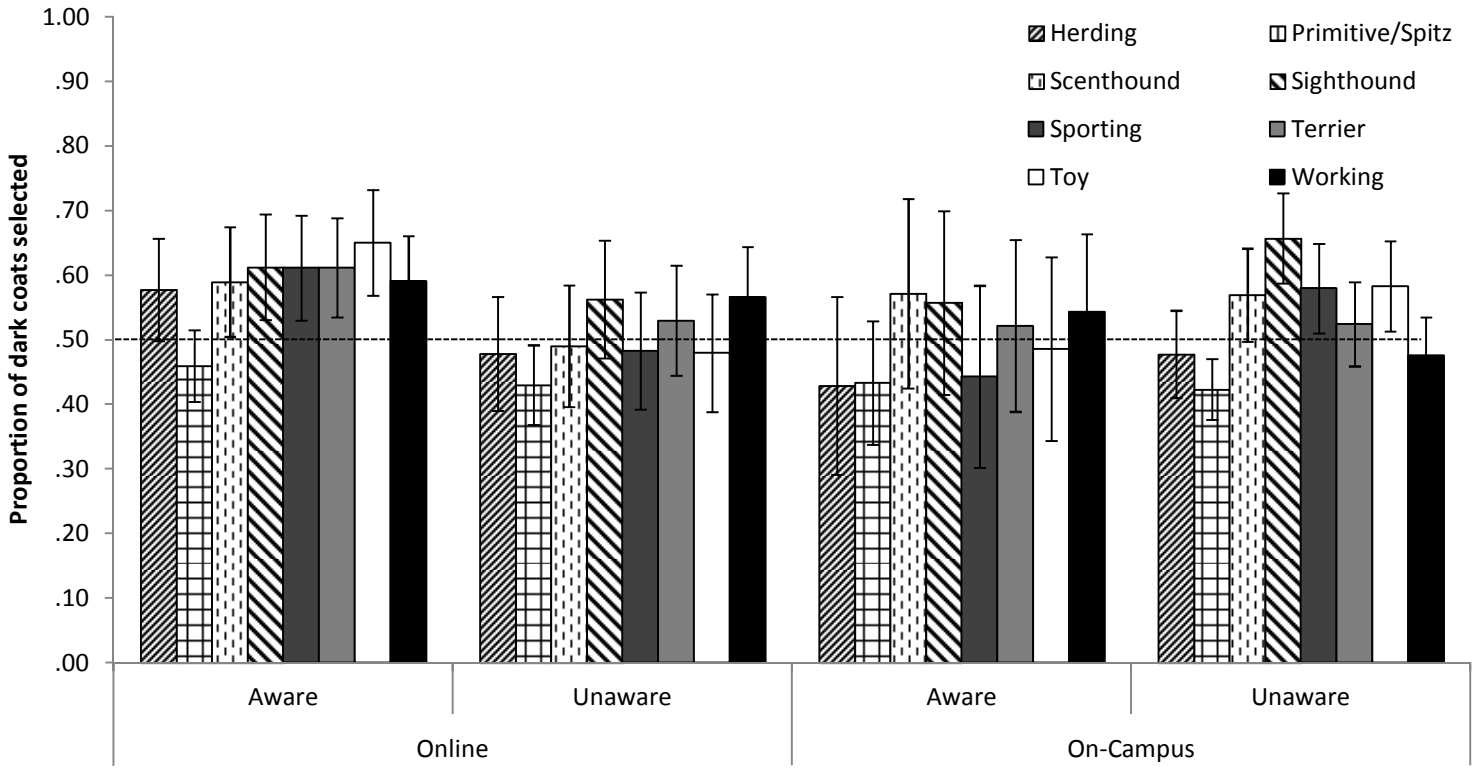


Figure 3.16. Proportion of selections indicating a dark coat preference across breed groups for BBDS aware and unaware online and on-campus participants. Error bars represent the 95% CI. The dotted line represents no preference such that, bars above the dotted line represent a preference for dark coats and bars below the dotted line represent a preference for light coats.

3.3.3.2.1.3 BBDS Awareness and Dog Source

These analyses were not performed as neither the main effects of BBDS awareness or dog source were statistically significant for either the on-campus or online sample.

3.3.3.2.1.4 Culturally Significant Breeds

To examine whether the proportion of dark coat selections for the culturally significant breeds varied by participant source, two mixed 2 x 3 mixed ANOVA were conducted (one for Labrador Retrievers and one for the Newfoundland dog), where participant source (online, on-campus)) was the between-subjects variable and Coat Colour comparison (black vs. chocolate/brown, black vs. yellow/Landseer, chocolate/brown vs. yellow/Landseer) was the within-subjects variable. For each coat comparison, a dark preference was defined as a preference for the darker of the two coats involved.

Labrador Retriever

A significant coat comparison x participant group interaction emerged, $F(1.45, 213.72) = 3.20$, $p < .002$, where online participants selected a greater proportion of black-coated Labrador Retrievers when compared to the chocolate coats, $M = .61$, $CI = .54 - .69$ and $M = .47$, $CI = .39 - .54$, respectively. Both participant groups had similar proportions of dark coats selected for the black vs. yellow coat comparison (online: $M = .52$, $CI = .48 - .60$ and on-campus: $M = .58$, $CI = .51$ ï 66). When the coat comparison did not involve the black coat, online participants selected a greater proportion of yellow coats than on-campus participants, $M = .40$, $CI = .32 - .48$ and $M = .54$, $CI = .46 - .62$, respectively).

Newfoundland Dog

Both main effects emerged as significant: coat comparison, $F(1.61, 237.25) = 6.57$, $p < .004$ and participant group, $F(1, 147) = 22.44$, $p < .001$. Online participants selected a greater proportion of dark coats over all comparisons, $M = .60$, $CI = .55 - .65$ vs. $M = .43$, $CI = .38 - .48$ than on-campus participants. In regards to coat comparisons, when black was compared to brown, a preference for the black coat emerged, $M = .58$, $CI = .53 - .63$, while no preference emerged for either of the other coat comparisons: black vs. Landseer, $M = .49$, $CI = .44 - .55$ and brown vs. Landseer, $M = .47$, $CI = .42 - .52$. These effects were qualified by a significant comparison x participant group interaction, $F(1.61, 237.25) = 8.62$, $p < .002$. Online participants showed a significant preference for black coats when they were represented in the comparisons whereas on-campus participants did not show the same preference pattern. See Fig 3.17.

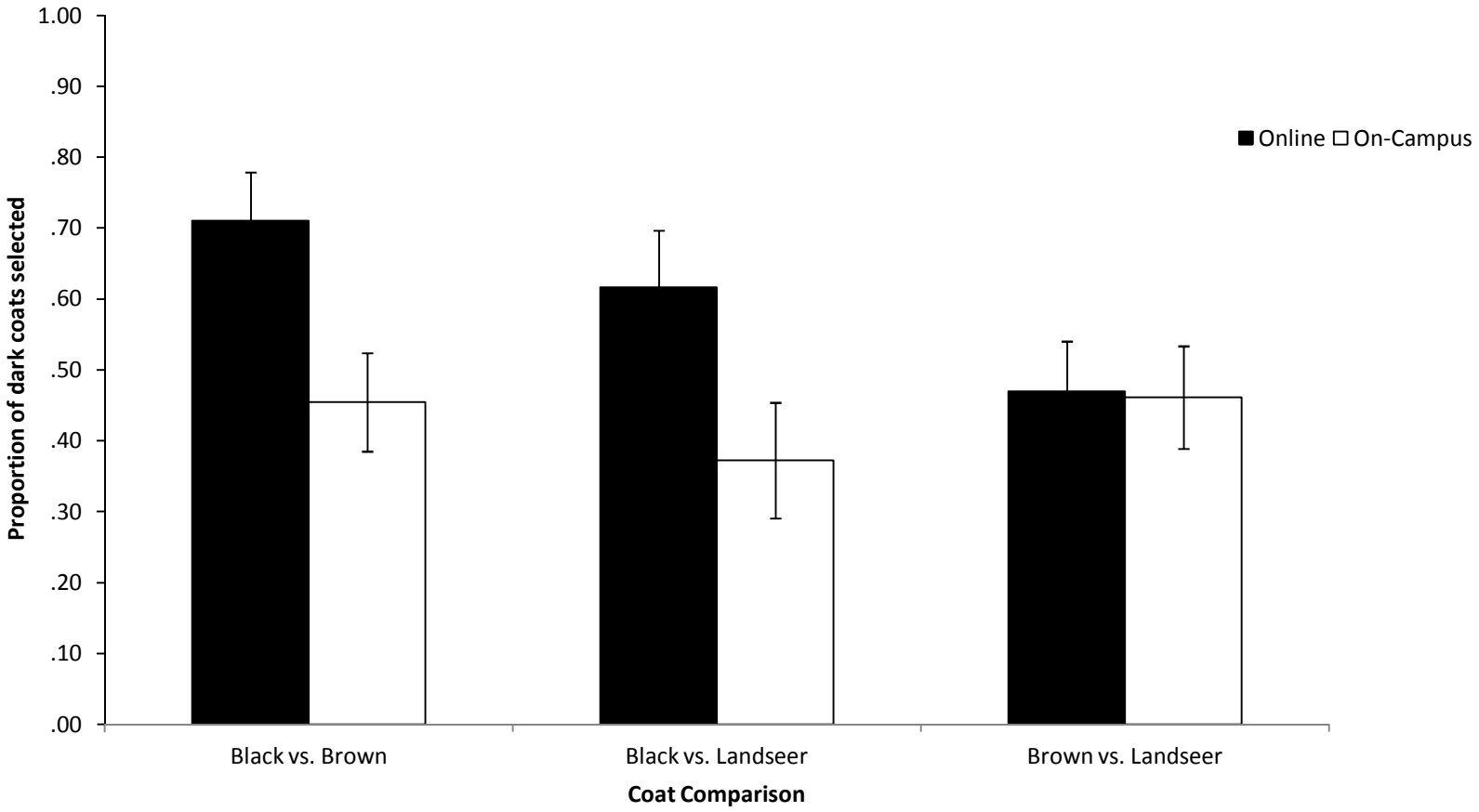


Figure 3.17. Proportion of selections indicating a dark coat preference for each Newfoundland dog coat comparison by online and on-campus participants. Error bars represent the 95% CI. The dotted line represents no preference such that, bars above the dotted line represent a preference for dark coats and bars below the dotted line represent a preference for light coats.

3.3.3.2.2 Coat Type Preferences

3.3.3.2.2.1 Source of Dog x Breed Group

To examine whether the proportion of selections that indicated a preference for short coats varied by source of dog and breed group for either online or on-campus participants, two separate 2 x 8 mixed ANOVAs were conducted, where source of dog (shelter vs. breeder) was the between-subjects variable and breed groups (8 groups) was the within-subjects variable. The results revealed a main effect of breed group for both online and on-campus participants, indicating that the breed groups differed significantly in proportion of short coats preferred, $F(5.38, 392.46) = 6.09$, $p < .001$ and $F(5.31, 377.29) = 30.59$, $p < .001$, respectively. On-campus participants showed a preference for short coats for half of the breed groups: Scenthounds: $M = .57$, *CI*: .51 - .63; Sporting: $M = .70$, *CI* = .66 - .75; Terrier: $M = .72$, *CI* = .67 - .78; and Working: $M = .58$, *CI* = .52 - .64. They showed a long coat preference for the Herding group ($M = .36$, *CI* = .32 - .40) and no preference for either coat type for the remaining three breed groups: Primitive/Spitz ($M = .52$, *CI* = .46 - .59), Sighthound ($M = .48$, *CI* = .42 - .54) and the Toy ($M = .49$, *CI* = .43 - .55). The online participants showed slightly different preferences, however their preferences were also qualified by a significant breed group x dog source interaction, $F(10.75, 392.46) = 2.40$, $p < .008$. This effect however, was not examined further due to the previously mentioned wording error that led to discrepancies in sample size.

3.3.3.2.2.2 BBDS Awareness x Breed Groups

Due to the large differences in sample size between online ($N = 818$) and on-campus ($N = 72$), two separate 2 x 8 mixed ANOVA were conducted to examine whether the proportion of selections that indicated a preference for short coats for specific breed groups was related to

whether participants were aware of BBDS or not. BBDS awareness (yes, no) was the between-subjects variable and breed group (8 groups) was the within-subjects variable. The results revealed no main effect of BBDS awareness for either online or on-campus participants. The main effect of breed group remained for both samples, $F(5.34, 397.86) = 8.08$, $p < .001$ and $F(5.22, 365.35) = 14.74$, $p < .001$, respectively. No interactions emerged for either participant group.

3.3.4 Individual Breeds

3.3.4.1 Coat Colour Preferences

Breed groups consisted of varying numbers of individual breeds to ensure a large range of dog types were included. Preferences for color and coat type of individual breeds within breed groups were examined to determine whether they followed similar patterns. Patterns for preferences were compared for on-campus and online participants.

Proportional data were calculated in the following matter: each breed was presented x number of times. The number of times a selection was made that indicated a dark preference, y, was recorded. The mean proportion of dark preference was calculated by dividing the number of dark preference selections for a particular breed by the number of times that breed had been presented, i.e. y/x. Mean preferences for both online and on-campus groups for all individual breeds in Fig 3.18. Estimated marginal means and standard error of the mean are reported when significant main effects emerged.

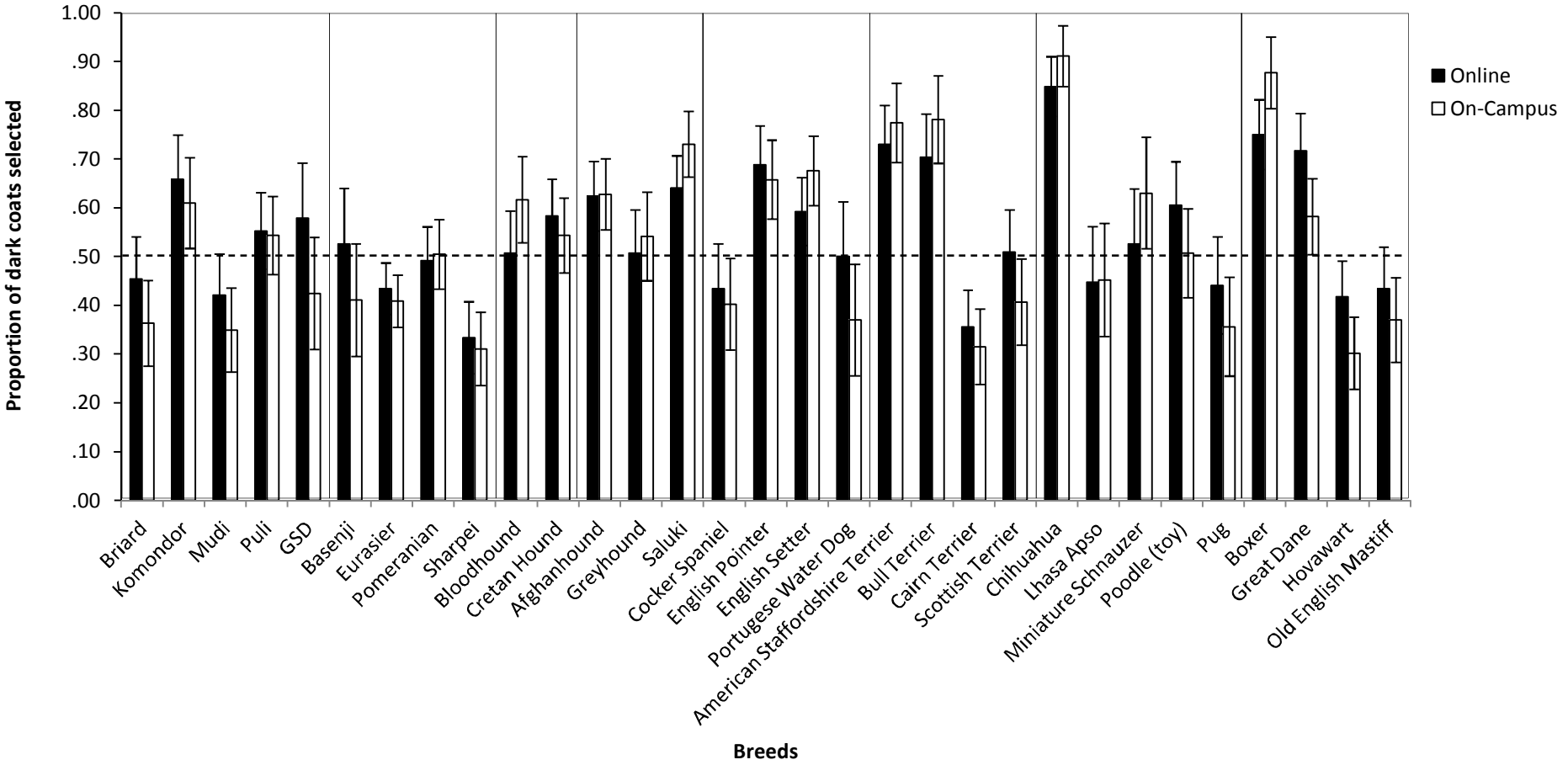


Figure 3.18. Proportion of selections made by online and on-campus NLers indicating a dark coat preference for individual breeds. Error bars represent the 95% CI. The dashed horizontal line represents no preference such that, bars above the line represent a preference for dark coats and bars below the line represent a preference for light coats. Boxes distinguish between breeds constituting a breed group.

Herding Breeds

A 2 x 5 mixed ANOVA was conducted with NL participant groups (online/on-campus) as the between-subjects variable and the five breeds composing the herding group as the within-subjects variable. A main of effect of breed was found, $F($3.50, 514.05) = 13.37, $p < .001$. Pairwise comparisons revealed that significantly more dark coat selections were made for the Komondor than for any other Herding breed ($M = .63$, *CI*: .57 - .70), (vs. Briard $t(152) = 5.77$, $p < .001$; Mudi $t(152) = 6.92$, $p < .001$; Puli $t(152) = 2.97$, $p < .037$; GDS $t(152) = 2.93$, $p < .042$). The Puli ($M = .55$, *CI*: .49 - .60) also received proportionally more dark coat selections than the Briard, $t(152) = 3.78$, $p < .003$, and the Mudi, $t(152) = 4.66$, $p < .001$. The remaining breeds did not differ in the proportion of dark coats selected: Briard ($M = .41$, *CI*: .35 - .47), Mudi ($M = .39$, *CI*: .33 - .45) and GSD ($M = .50$, *CI*: .42 - .58). There was no main effect of participant group, nor any interaction between variables.

Primitive/Spitz Breeds

A 2 x 4 mixed ANOVA, where participant group was a between-subjects variable and the four breeds composing the primitive/spitz breeds was the within-subjects variable, was conducted. There was a significant breed effect, $F(2.60, 381.48) = 7.55$, $p < .001$. Post hoc pairwise comparisons revealed that a greater proportion of light coats were selected for the Sharpei ($M = .32$, *CI* = .27-.38) than for any other primitive/spitz breed: Eurasier ($M = .42$, *CI* = .38 - .46) $t(151) = 2.75$, $p < .041$; Basenji ($M = .47$, *CI* = .39 - .55), $t(151) = 3.34$, $p < .007$; and Pomeranian ($M = .50$, *CI*= .45 - .55), $t(151) = 5.68$, $p < .001$. There was no main effect of participant group or interaction between participant group and breed group.

Scenthound Breeds

A 2 x 2 mixed ANOVA was conducted where participant group was the between-subjects variable and two breeds composing the scenthound breed group was the within-subjects variable. Only a significant interaction effect emerged, $F(1, 147) = 4.27$, $p < .042$, where on-campus participants preferred a greater proportion of dark-coated Bloodhounds than did online participants ($M = .62$, CI: .53 - .71 and $M = .51$, CI: 42 - .59, respectively). Online participants, however, preferred a greater proportion of dark-coated Cretan Hounds than did on-campus participants, the latter of whom did not show a Coat Colour preference ($M = .58$, CI: .51 - .66 and $M = .54$, CI: .47 - .62, respectively). No significant main effects emerged.

Sighthound Breeds

A 2 x 3 mixed ANOVA was conducted where participant group was the between-subjects variable and three breeds composing the sighthound breed group was the within-subjects variable. The ANOVA showed a main effect of breed, $F(1.94, 285.043) = 17.45$, $p < .001$. The Greyhound differed in terms of coat colour preference from the other two breeds, the Afghanhound and Saluki, as there was no preference for the former ($M = .52$, CI: .46 - .59), $t(150) = 3.52$, $p < .003$ and $t(150) = 5.59$, $p < .001$, respectively, while both the Afghanhound and Saluki were preferred with dark coats ($M = .62$, $CI = .58$ - .66 and $M = .70$, $CI = .66$ ï .74, respectively). No main effect of participant group or interaction effects emerged.

Sporting Breeds

A 2 x 4 mixed ANOVA was conducted where participant group was the between-subjects variable and the four breeds composing the sporting group was the within-subjects variable. A significant main effect of breed, $F(2.54, 372.77) = 24.60$, $p < .001$ emerged where English Pointers ($M = .67$, CI: .62 - .73), and English Setters ($M = .63$, CI: .58 - .68) were both preferred

with dark coats compared to the Cocker Spaniel (M = 42, CI: .35 - .48), $t(151) = 7.50$, $p < .001$ and $t(151) = 6.75$, $p < .001$, respectively; and Portugese Water Dog (M = .44, CI: .36 - .52), $t(151) = 5.41$, $p < .001$ and $t(151) = 4.63$, $p < .001$, respectively. There was no interaction or main effect of participant group.

Terrier Breeds

A 2 x 4 mixed ANOVA was conducted where participant source was the between-subjects variable and the four breeds composing the terrier breed group was the within-subjects variable. A significant main effect of breed emerged $F(2.75, 404.15) = 70.64$, $p < .001$, where the Bull Terrier (M = .74, CI: .68 - .81),Staffordshire Terrier (M = .75, CI: .70 - 81) and Scottish Terrier (M = .46, CI: .40 - .52) all had a greater proportion of dark-coats selected than the Cairn Terrier (M = .34, CI: .28 - .39), $t(151) = 11.31$, $p < .001$; $t(151) = 11.58$, $p < .001$; and $t(151) = 3.94$, $p < .002$, respectively. Again, no significant main effect of participant source or interaction emerged from the analysis.

Toy Breeds

A 2 x 5 mixed ANOVA was conducted where participant source was the between-subjects variable and breeds composing the toy breed group was the within-subjects variable. A significant main effect of breed was found, $F(3.45, 507.38) = 37.59$, $p < .001$. Post hoc analyses revealed that the Chihuahua (M = .88, CI: .83 - .92) had a greater proportion of dark coat selections than the other four breeds: Lhasa Apso (M = .45, CI: .37 - .53), $t(152) = 10.00$, $p < .001$; Miniature Schnauzer (M = .58, CI: .50 - .66), $t(152) = 7.55$, $p < .001$; Toy Poodle (M = .56, CI: .49- .62), $t(152) = 10.13$, $p < .001$; and Pug (M = .40, CI: .33 - .47), $t(152) = 12.33$, $p < .001$. The Pug was the only breed of the group for which participants had an overall light coat

preference; the proportion of light coats selected for this breed was significantly higher than for the Miniature Schnauzer and Toy Poodle, $t(152) = 3.46$, $p < .008$ and $t(152) = 3.76$, $p < .004$. There was no significant main effect of participant group or interaction.

Working Breeds

A 2 x 4 mixed ANOVA was conducted where participant source was the between-subjects variable and breeds composing the working breed group was the within-subjects variable. A main effect of breed emerged, $F(2.91, 427.65) = 81.68$, $p < .001$. Post hoc pairwise comparisons revealed that the Boxer ($M = .81$, *CI*: .76 - .86) received a greater proportion of dark-coat selections than the Great Dane ($M = .65$, *CI*: .60 - .70), $t(151) = 4.69$, $p < .001$; the Old English Mastiff ($M = .40$, *CI*: .34 - .46), $t(151) = 11.74$, $p < .001$; and the Hovawart ($M = .36$, *CI*: .31 - .41), $t(151) = 14.19$, $p < .001$. The Great Dane also received more dark-coat selections than the Mastiff, $t(151) = 7.09$, $p < .001$, and the Hovawart, $t(151) = 9.67$, $p < .001$. This main effect was qualified by a significant participant source x breed interaction, $F(2.91, 427.65) = 6.40$, $p < .001$, such that online participants selected a greater proportion of dark coats for all breeds except the Boxer: Great Dane (online: $M = .72$, *CI*: .64- .79; on-campus: $M = .58$, *CI*: .50- .66); Hovawart (online: $M = .42$, *CI*: .35- .49; on-campus: $M = .30$, *CI*: .23- .38); and Old English Mastiff (online: $M = .43$, *CI*: .35- .52; on-campus: $M = .37$, *CI*: .28- .46). Conversely, the on-campus participants selected a greater number of dark coats for the Boxer (online: $M = .75$, *CI*: .68- .82; on-campus: $M = .88$, *CI*: .80- .95). Similar to the other breed group analyses, no main effect of participant group or interaction emerged.

3.4 Discussion

The purpose of this study was to examine the role of several variables that may contribute to, or influence, the belief that big and black, or simply black dogs are overlooked by possible adopters in favour of lighter-coated dogs, particularly in shelter settings. This phenomenon, known as Big Black Dog Syndrome (BBDS) appears to have originated from the experiences of shelter-care workers, although some breeders also report similar biases in their puppy buyers. To examine the influence of these various factors, I developed a task in which participants, both online and in person, viewed photographs of pairs of dogs that varied in Coat Colour (dark vs. light) or Coat Type (short/smooth vs. long/rough), and rated their preferences for one or the other dog. To examine whether BBDS affects shelter dogs exclusively, a dog source variable that led participants to believe dogs were being offered by either a shelter or a breeder was included in the study. Additionally, the effect of breed group (eight groups - Herding, Primitive, Scenthound, Sighthound, Sporting, Terrier, Toy and Working) was also examined, based on some authors (e.g. Coren, 2011) reporting that specific breeds were particularly susceptible to BBDS. Beyond specific dog characteristics, participant demographics (sex, age, housing situation, dog experience and dog knowledge), and, in particular, geographical location (Canada, US and Newfoundland) were examined to determine their effects on dog coat preferences. Finally, individual breeds were examined to determine whether there were some physical characteristics that were preferred universally, or whether preferences for traits varied within breed groups. Identifying factors that predict or correlate with dog adoption and euthanasia rates has been the topic of previous research (Coren, 2011; Leonard, 2011; DeLeeuw, 2010; Lepper, Kass & Hart, 2002; Posage, Bartlett & Thomas, 1998), although findings have been mixed. Scientific studies have made use of shelter records when analysing the role of coat colour in adoption and

euthanasia (Brown *et al.,* 2013; DeLeeuw, 2010; Diesel *et al*., 2008; Duffy *et al*., 2008) whereas others have designed studies by carefully selecting stimuli and recording participant reactions (Archer & Monton, 2011; Coren, 2011; Gazzano *et al*., 2012; Fratkin & Baker, 2013). Few of these latter studies, however, were able to record participant responses for a large and diverse pool of dog breeds and types. The present study included several breeds and phenotypes, eight breed groups that were composed of several breeds, that were used to examine participant preferences which they indicated by selecting one of two dogs in a forced-choice pairing.

3.4.1 Participants

Sex and Age

Both participant groups (online and on-campus) had a female-majority of respondents, though the majority was not as strong for the on-campus group. The online group was comprised of all age categories, including 23.2% mature adults. No main effects of sex or age emerged for either coat colour or coat type preferences. Age did interact with breed groups for coat colour preferences.

Housing

There was no main effect of housing for the coat colour preferences; however an interaction did emerge for coat type preferences where online participants who rented or owned their own house preferred short coats for the Primitive/Spitz and Working breeds while those who lived with family did not report a preference for either coat type. Long-coated dogs are often associated with more demanding grooming requirements. Individuals that rent or own their own homes may already be accustomed to regular housekeeping and wish not to increase to the workload that a long-coated dog may add.

Country / Location

Online participants include participants living across both the United States of America and Canada whereas on-campus participants were all currently living in Newfoundland, Canada. Certainly, exposure to and cultural views of black dogs may vary geographically and thus may partially account for any differences in participant colour preferences. For example, American participants made significantly more dark selections for the Labrador Retriever than did Canadian participants, however this was not the case for the Newfoundland dog. The Labrador Retriever has been reported to be the most popular family dog by the American Kennel Club (AKC). Interestingly, participants from NL differed from other Canadian participants in their Coat Colour preferences for the Newfoundland dog, preferring a black coat when it was an option; in the remainder of Canada, participants tended to prefer the black and white Landseer when compared to a pure black coat.

Despite both dogs having names related to the province of Newfoundland and Labrador, it is possible that many people are unaware of the connection between the Labrador Retriever and the province, the latter of which is commonly shortened to only "Newfoundland." Arguably, the connection between the Newfoundland dog and the province's name is more difficult to miss. Comparisons between Newfoundland online and on-campus participants are made in a later section (*4.2.1.3*).

Self Identification

Half of all participants considered themselves dog people. An additional 25.6% (online) and 31.5% (on-campus) considered themselves both dog and cat people. These proportions reflect that the study was successful in attracting people with an interest in dogs; these

proportions are not likely representative of the general population. Interestingly, however, self-identification did not predict Coat Colour preferences for either participant group. Self identification did predict coat type preferences, however only for online participants, where dog people preferred a greater proportion of long coats than participants who identified as both/neither dog and cat people. These results, however, may be spurious due to the sheer number of participants and statistical comparisons made.

Dog Experience

Online participants reported, currently and previously, owning more dogs than on-campus participants. This is likely a reflection of housing situation and age demographics described above. From (currently and previously) owning a greater number of dogs, online participants are likely to be more familiar with canine issues, including grooming requirements and shedding that may influence Coat Colour and Type preferences.

BBDS Awareness

The online study was able to reach a diverse group of participants. The link to the online survey was distributed using mainly social media and email. Many animal interest groups, such as shelters, rescues and training groups were contacted and asked to distribute the link. Members of these groups are more likely engaged in the dog community and thus exposed to canine issues, such as BBDS. It is surprising, that only 68% of respondents reported being aware of BBDS. Further examination revealed that significantly more US participants (83.5%) reported being aware of BBDS compared to 56.6% of Canadian participants and, thus, appear to have been more likely to compensate by selecting the darker-coated dog in a comparison pair.

Additionally, due to the time commitment involved in completing the study online, only participants with a great degree of interest likely completed the study thus leaving the online participant pool with highly interested and self-motivated individuals. Similarly, on-campus participants who were required to sign up to participate in the study also demonstrated self-motivation. It is interesting to note that the on-campus participant group was more successful at the Breed Identification Task than the online participants. It is likely that on-campus participants were more familiar with multiple choice testing due to being university students whereas the online participant group had a greater diversity. Additionally, the on-campus study only included participants living in the St. John's, Newfoundland area. Geographical and cultural influences may be at work, though these topics will be discussed later in section *3.4.2.1.3.*

Dog Knowledge

Despite reporting owning a great number of dogs, currently and previously, the online participant group earned a lower mean accuracy score on the Breed Identification Task designed to gauge dog knowledge. This task therefore may not have been an appropriate measure as many on-campus participants demonstrated an ability to identify purebred dog breeds, yet were unaware of BBDS. This result exemplifies that the ability to identify dog breeds does not necessary correlate with broader knowledge of shelter and rescue issues, most of which predominately deal with mixed breeds. Rather, the ability to identify breeds may be more strongly associated with highly organized canine activities such as showing which emphasizes appearance and adherence to breed standards. Additionally, lack of control for the online participants may have been an influencing factor. While a quiet and comfortable laboratory setting was provided for on-campus participants, those who participated online may not have been afforded the same conditions. Distractions, influence from others (although asked to

complete as an individual), time restraints, among other factors may have influenced online participantsô performance.

Also important to note, this particular Breed Identification Task did include both culturally significant breeds and thus may have offered the on-campus participants an advantage, accounting for the higher accuracy scores.

3.4.2 Preference Statistics

3.4.2.1 Coat Colour Preferences

3.4.2.1.1 BBDS & Dog Source

BBDS was born out of a shelter context and was first described by individuals who worked in these environments. Leonard (2011) states that BBDS is a phenomenon exclusive to shelter animals and thus does not affect dogs offered by dog breeders. This idea of exclusivity, however, has been challenged in personal communication with dog breeders. No known studies have examined the possibility of BBDS affecting pedigree dogs despite some dog breeders reporting that potential buyers also seem to prefer light-coated puppies to their darker-coated litter-mates (Josée Dessouroux, personal communication). This study examines the influence of dog source not only due to the conflicting reports, but also because breeders (53%) and shelters (31%) were believed to be the best source to obtain a dog (Ramirez, 2006). As such, understanding factors that influence purchases and adoptions are of interest to both sources.

The strong positive view of dog breeders reported in the above study (Ramirez, 2006) may reflect people's views of purebred dogs. Indeed, purebred status had the greatest influence on whether a dog was adopted or euthanized (DeLeeuw, 2010). Similarly, Patronek *et al.* (1995)

reported that purebreds were 1.8 times more likely to be adopted than mixed breed dogs. Although no known studies have examined why purebreds are more highly sought than mixed breeds, it is plausible that purebreds are viewed as a status symbol due to their often expensive purchase price (DeLeeuw, 2010; Derr, 1997). Additionally, there are breed groups and classes available at dog shows for specific breeds of dog. Exclusive memberships to these groups and shows in which only purebred dogs are eligible for titles and awards may be among the reasons purebred dogs are less often relinquished to shelters.

The present study examined the role of dog source by telling participants that the dogs they were about to be shown were offered by either a dog breeder or by a shelter. This manipulation revealed that dog source was only a significant factor for the online participant group, where there was no preference for Coat Colour for dogs offered by breeders but a dark coat preference for dogs offered by shelters. The on-campus participant group did not replicate this finding. One reason may be because the online participant group was more aware of BBDS - 67.6% of online vs. only 19.4% of on-campus participants reported they were aware of the phenomenon. It is possible that online participants who were aware of BBDS and read that dogs were being offered by shelters had their associative memories activated, due to the close association between shelters and the phenomenon. This activation may have influenced these participants' preference selections on either a conscious or unconscious level. That is, a BBDS aware participant may have felt compelled to select the black-coated dog because they believed it would not likely be adopted otherwise and thus more likely to be euthanized, whereas they believed the light-coated dog was likely to find a home and thus not be in danger of being put down. If such a thought pattern occurred, BBDS aware participants' selections may not represent a true preference, but a calculated decision to "save" the black dog. Conversely, participants that

read that the dogs were being offered by a dog breeder were less likely to make an associative memory with BBDS, due to the absence of the word "shelter" and therefore less likely to compensate by selecting a greater proportion of dark-coated dogs.

Alternatively, BBDS may be associated with shelters due to other factors inherent to many shelters. One common explanation for BBDS is that the faces of dark-coated dogs are often difficult to see due to insufficient lighting (Leonard, 2011; DeLeeuw, 2010; Wells & Hepper, 1992). Some shelters, in an effort to increase adoptions of dark-coated dogs, train them to approach the front of their cages when potential adopters visit. The proximity may increase the ability to read the dark canine faces vs. when they are further away and features may be loss in shadows. Additionally, some shelters ensure that dogs have bright-coloured toys in their cages to increase the perception of playfulness. Another countermeasure some shelters take is to ensure that quality photographs of their dark-coated canines are available to increase interest from shelter visitors (e.g. http://www.lifewithdogs.tv/2014/03/stunning-photos-help-fight-black-dog-syndrome/). One limitation of the present study was that many of photos used were taken outdoors in a well-lit environment and thus not be representative of what a typical shelter visitor may encounter when looking to adopt a dog. Additionally, all photographs were taken of purebred dogs, often in a show or professional environment. It is highly unlikely that a mixed breed would be shown and photographed in such a fashion and so it is possible that using different photographs, more typical of what shelter visitors see, would alter the results of this study. Many reputable dog breeders include quality photographs of their dogs, including the parents of the available offspring and show records.

One explanation for dark preferences offered by participants after completing the study was that dirt was not as visible on dark-coated dogs whereas it is easily visible on light-coloured

coats. Additionally, different colour hair may appear more visible on carpets and floors. Lifestyle of both owner and dog, as well as the reason for owning a dog, and environment likely contribute to this concern. Individuals who often travel with their dog(s) or allow them in their cars/beds/homes may therefore appreciate certain coat colours more so than others. In contrast, participants who own and keep their dog(s) mostly outside and view them exclusively as working dog(s) (e.g., herding, hunting, etc.) may place less importance on visibility of dirt/hair. Finally, these factors are likely influenced by seasonal conditions. In environments where mud is common, more emphasis may be placed on coat colours and types.

3.4.2.1.2 Breed Groups & Individual Breeds

A breed group effect was consistently shown in the above analysis. With that, a closer examination of coat preferences of the breeds constituting a breed group was warranted. To do so, eight ANOVAs were conducted where individual breeds constituting a breed group was the within-subjects variable and participant group (online and on-campus NLers) was the between-subjects variable. Results from these ANOVAs reveal a fairly consistent effect of breed, indicating that even individual breeds from the same breed group do not always follow similar preference patterns. There was rarely an effect of participant group (only for the Scenthound analysis) further suggesting that individual breeds are associated with specific coat colour preferences (although all participants in the analysis were currently living in NL so a larger generalization would require more research). This suggests that participants are sensitive to individual breed differences and that there is no general or universal colour preference for all dogs, but that participants may have a prototype for individual breeds which likely includes coat colour. Variations from the prototype may or may not be preferred over the prototype. Both

novelty (Fantz, 1964; Berlyne, 1970; Bevins and Bardo, 1999) and familiarity (mere exposure effect: Zajonc, 1968, 2001) have been linked to liking.

It has been suggested that a number of breeds may suffer from BBDS more so than others. Many breeds that are considered guard dogs (e.g. Doberman Pinschers, Rottweilers, German Shepherd Dogs) have predominately dark coats. Many of these breeds also experience negative attention in the media and are portrayed as aggressive (Clifton, 2014; NCRC, 2010; Svartberg, 2006). The association between dark-coated dogs and aggressiveness may perpetuate BBDS; this idea that dark and black coats are subconsciously linked to evil and negativity is another explanation for the existence of BBDS (Leonard, 2011). This study found however, that dark coats were preferred over light coats for the Bull Terrier and Staffordshire Terrier, two breeds that commonly are viewed as with Pitbull types and dangerous breeds. Mastiffs, however, were preferred with light coats, suggesting, that if any association between coat colour and a subconscious negative perception exists, it is mediated by dog breed.

3.4.2.1.3 Cultural & Geographical Influences

One purpose of the study was to examine the role of cultural and geographical location on participant preferences. The Canadian province of Newfoundland and Labrador has two official dog breeds, the Newfoundland dog and the Labrador Retriever, that share the name of the province and are largely celebrated in the area. Statues of the breeds stand in two separate popular tourist locations in the capital city of St. John's - in Harbourside Park and on Signal Hill. Both of these breeds occur in three coat colours from black to brown/chocolate (both breeds) and a black/white mix (Landseer/Newfoundland) and yellow (Labrador Retriever). This unique situation allowed for preference comparisons between NLers and participants from other regions.

Additionally, it allowed for comparisons between online and on-campus NLers though this will be discussed in more detail later (3.*4.2.1.4*).

Online NLers seemed to only depart from the remaining participants in regards to coat colour preference when considering the Newfoundland dog, specifically when black coats were involved, whereas online non-NL participants showed a preference for the Landseer when it was involved, only preferring the black coat when compared to the brown Newfoundland dog. However, NLers showed a preference for black coats in both comparisons involving black coats. The preference was most apparent when comparing the pure black Newfoundland coat to the Landseer's black and white mixed coat. NLers did not show a preference for either the brown or Landseer coat. These findings are particularly interesting as there is inconsistent classification of the Landseer as a colour-variant of the Newfoundland dog (AKA & CKC) or a separate breed (FCI). If NL participants did not consider the Landseer as a Newfoundland dog, it may have influenced their selections. Additionally, it is possible that even if the Landseer was widely considered a colour-variant of the Newfoundland dog, that participants generally preferred the traditional black coat, which is reported to be the most common. An exposure effect, the phenomenon where individuals tend to like objects they are repeatedly exposed to, is one explanation for the finding. However, statistical data on the population numbers of specific dog breeds and predominance of coat colours are not readily available. Further investigation found that NLer's coat preferences for other breed groups and breeds did not deviate significantly from those of other participants.

3.4.2.1.4 Participant Source: Online vs. On-Campus

NLers completed the study both online and on-campus, providing an opportunity to compare both methods of data collection. There have been many discussions on the validity of internet-based studies (Gosling, Vazire, Srivastava & John, 2004). Having these two samples allows us to make direct comparisons between the two methods. It is important to note however, that while these two samples both currently lived in NL, they did still had noteworthy differences and similarities.

Both samples had similar proportion of males and females and self-identified dog people, cat people, etc.; however, online participants were generally older with more dog experience. They also were more likely to report owning their own home and being aware of BBDS than on-campus participants. Interestingly, however, on-campus participants performed better on the Breed Identification Task. Despite these differences, however, a main effect of participant group only emerged for the Newfoundland dog. More often, participant source interacted with another variable, such as breed group or coat comparison; interestingly, this was most pronounced for the culturally significant breeds ï the Labrador Retriever and Newfoundland dog. Online participants selected a greater proportion of black coats than on-campus participants when they were compared to chocolate-coated Labrador Retriever, although neither participant group showed a preference when black was compared to yellow. Online participants, however, more strongly preferred the black coat in both comparisons involving the Newfoundland dog, i.e. they preferred black over the brown and Landseer coat. This is in direct contrast to the preferences shown by on-campus participants; the latter had an overall preference for light coats for the Newfoundland dog. The differences in preference patterns between the two participant groups and two provincial breeds were somewhat surprising, due to the assumption that both groups

would be familiar with both breeds, particularly the black coat variations, as they are so popular in the province. The Labrador Retrieverôs coat variations are solid colours, i.e. all yellow, chocolate or black, whereas the Landseer has a mixed black and white coat. Thus the on-campus participants did not have a total bias again coats containing black..

Due to the on-campus participation being limited to students attending Memorial University of Newfoundland located in St. John's, Newfoundland, it is impossible to compare the effect of completing the study online vs. in person for participants from other locations. The online component of the study was able to reach many participants quickly and from a diverse range of locations whereas more effort was required to recruit on-campus participants (e.g. scheduling appointments, booking computer labs, etc.). However, the on-campus study was conducted under considerably more experimental control; distractions were limited (testing took place in a quiet computer lab, the experimental program did not allow participants to deviate from the study window) and participants could complete the task without interruption. Additionally, on-campus participants had the opportunity to ask questions or for clarification whereas online participants were not afforded the same opportunity. The circumstances in which online participants completed the study are unknown, despite being instructed to complete the study individually in a quiet room without interruption. Further research in how online and in-person studies compare is still needed.

3.4.2.2 Coat Type Preferences

Although coat type is not directly related to BBDS and itôs consequences, it has been reported as a significant morphological variant associated with adoption of shelter dogs (DeLeeuw, 2010; Protopopova *et al.*, 2012; Wells &Hepper, 1992). In the current study,

preferences for Coat Type, consistently varied by breed group, suggesting again that there is no universal preference for long or short-coated dogs. These findings further support the idea that participants may possess breed-specific, rather than dog-general, prototypes that influence their preferences. Coat Type preferences may also be influenced by experience and knowledge. Long-coated dogs often require more grooming than shorter-coated dogs. This would demand greater time and effort, and possibly expense, from the owner, therefore lifestyle of both owner and dog must again be considered. Working dogs and dogs that mostly live outdoors would require coats that allow the animal to remain warm. Conversely, dogs that are mostly kept indoors and often travel with their owners may be preferred with less hair. Additionally, some coat types may be associated with medical issues such as, but not limited to, fur-matting, dandruff and other fungi. Treatment of these and other possible infections (fleas, ticks, etc.) may also influence Coat Type preference (likely easier to bathe and fully dry shorter-coats). This idea, however, did not find support in the current study, where the online NLers generally preferred more long-coated dogs than the on-campus participants, the former of whom, reported having more dog experience and were more likely to own their own house.

During conversation with an on-campus participant who had completed the survey, the participant suggested that long-coated dogs remained in shelters longer because they appeared larger due to their coats. It is possible that BBDS aware participants in the Shelter condition selected a greater number of long-coated dogs than did the BBDS unaware participants to compensate for a potential dog size bias, i.e. short-coated dogs may appear smaller than their long-coated counterparts and BBDS suggests that ñbig and blackò dogs are affected by the possible bias. Indeed, DeLeeuw (2010) reported that "smallness" was the second most important factor in regards to adoption, whereas having a "medium" coat was the sixth most important

factor (after "not having a primarily black coat"). More research into Coat Type as a factor affecting adoptions would be beneficial, particularly for large, black dog with different coat lengths.

3.4.3. Study Limitations

3.4.3.1 Photographs

One of the major limitations of the present study was the use of photographs. Photographs are often used by both shelters and breeders to advertise dogs available for adoption or purchase, respectively. Many of the photos used in the present study were taken outdoors in a well-lit environment and thus may not be representative of what a typical shelter visitor may encounter when looking to adopt a dog. Furthermore dogs available from shelters are most often of mixed breed dogs, which may vary widely in physical characteristics. However, all photographs used were taken of purebred dogs, often in a show or professional environment. It is possible that using different photographs, more typical of what shelter visitors see, would alter the results of this study. Many reputable dog breeders include quality photographs of their dogs, including the parents of the available offspring and show records. As such, the photographs used in this study differed significantly from those typically used by shelters; that is, photographs of purebred dogs were used due to their close adherence to a breed standard, which dictates physical characteristics such as conformation. The photographed dogs were required to match as closely as possible, only differing by either Coat Colour or Coat type (the variables being examined). Although, using mixed-breed dogs may have been more representative of shelter dogs, those dogs are often unique in build and colouring, making it difficult to find a match. The criteria for matching photos, however, did not include matching for dog sex (if/when known). It

is possible that this and other characteristics that were not controlled affected participants' preferences.

Additionally, photographs are static images whereas individuals who are seriously looking for a dog often visit shelters and breeders to interact with the dogs personally. Personal interaction with a dog would expose individuals to a dynamic display of expressions whereas a photograph limits that to a single frame. Furthermore, shelter and breeder environments often differ in terms of lighting, size and other factors. Many of the photographs used in this study presented dogs outside and/or in a show environment. This may have weakened the association for those being told to imagine the dogs were being offered by a shelter, and thus may have reduced the likelihood of relying on BBDS knowledge when making preference selections. Further research into the effect of surroundings/environment on the perception of dogs would be beneficial. Some shelters have addressed the issue by bringing dogs out of their cages to interact with visitors, training dogs to approach visitors when they are caged and by placing toys in cages to increase perception of playfulness (Herron, Kirby-Madden & Lord, 2014).

3.4.3.2. Methods

This study was conducted using two methods: online (internet-based) and on-campus (traditional). There has been debate as to whether internet-based studies hold as much validity as the more-controlled, traditional methods (Best, Krueger, Hubbard & Smith, 2001; Gosling *et al.*, 2004). One of the positive aspects of conducting research online is the ability to reach large sample sizes. This was certainly the case in the current study, where online participants far outnumbered on-campus participants. Additionally, the online sample was more diverse in terms of demographic variables ï spanned a larger age range, level of housing and dog experience. The

online study was able to reach more BBDS aware participants, likely due to the online study link being primarily distributed by contacting dog interest groups and shelter/rescue organizations. These groups are more likely aware of BBDS whereas an average individual may be naive; this was illustrated by comparing awareness rates of NLers that completed the study online and on-campus. The opportunity to compare online NLersô and on-campus NLersô data provided additional insight when comparing internet-based and traditional research methods. Surprisingly, the current study only revealed an effect of participant source for the culturally significant dogs, where online participants generally preferred more black coats than on-campus participants. Because there were differences between the participant groups, other than how they completed the study, more research should be conducted to further investigate these differences.

The above limitations must of course be evaluated cautiously due to the error in wording regarding the Breeder condition. Due to the error and the majority of participants, particularly the NLers, completing the incongruent wording survey, the power to detect differences in conditions was weakened.

Another methodical limitation was that this study simply instructed individuals to imagine they were looking for a dog. Although an individual's imagination can be powerful, the situation they were asked to imagine may have been unrealistic. Participants were aware that the study was strictly hypothetical and they were free from acquiring a dog or any of the accompanying responsibility. It is possible that participants may have thought the dogs presented were attractive, but not interested in acquiring them. As mentioned above, participant responses were based solely on photographs, whereas personal interaction may alter preference. Therefore viewing photographs of available dogs is not a replacement for visiting a shelter/breeder.

Chapter 4: SUMMARY AND CONCLUSIONS

Overall, the current research did not provide support for the existence of BBDS. Neither a small pilot study in which participants rated dogs photographs on a set of six semantic differential adjectives (Chapter 2), or a much larger online and on-campus study, in which participants were forced to choose their ñpreferredò dog from sets of two photos presented to them simultaneously (i.e., photos of the same breed in a dark vs. light coat colour; Chapter 3) provided any support for a bias against dark-coloured dogs. In fact, a dark coat preference was observed for six of the eight ñbreed groupsò created (specifically, Scenthound, Sighthound, Sporting, Terrier, Toy, and Working groups). Participants showed an overall preference for light coats in only one breed group (Primitive/Spitz) and no coat colour preference in the remaining group (Herding). Furthermore, there were not necessarily similar coat preferences shown for the individual breeds that comprised a breed group. These findings suggest that peopleôs preference for canine coat colour is more complex than simply a preference for lighter-coat colours and may involve breed-specific attributes; this is clearly incompatible with the existence of BBDS as a general phenomenon.

BBDS Awareness

Interestingly, past study results have varied in terms of finding support for BBDS (e.g., DeLeeuw, 2010; Lepper, Kass & Hart, 2002; Posage, Bartlett & Thomas, 1998). Despite the mixed findings, many individuals appear convinced of the existence of BBDS. Participants in the current study who reported being aware of BBDS were more likely to prefer the photograph of the dark-coated dog over the lighter-coated match, particularly when participants were led to believe that the dog was from a shelter. This suggests that individuals believe that BBDS affects

shelter dogs more strongly than dogs purchased from breeders, if not exclusively. It is plausible that BBDS-aware participants consciously or subconsciously selected dark-coated dogs in an effort to compensate for the negative bias they believe exists against them.

Participant Demographics & Group (Online vs. On-campus)

Differences between participants, such as sex, age, housing, and their experience and knowledge of dogs may also influence their preferences of canine physical features. In particular, differences in preferences of participants from different geographic locations emerged. Generally speaking, American participants had higher rates of BBDS awareness; BBDS is believed to have originated in the USA. In Canada, rates of BBDS awareness were lower, although they varied across regions (NL, Maritimes, Central and Western Canada) generally with higher rates of awareness from the East to West coast, the exception being between NL and the Maritimes, where NLers reported greater awareness rates than participants from the Maritimes. The participants from NL offered a unique study opportunity as different NLers participated in the online and on-campus studies. These two participant groups differed significantly in multiple ways: compared to the online participants, the on-campus group was generally younger, fewer reported currently or previously owning a dog, and less than 20% (vs. 55%) reported being aware of BBDS. As well, the groups showed some differences in coat colour preferences for the eight breed groups and the culturally significant dogs, with more online participants expressing preferences for dark-coated dogs.

Further research would benefit from examining the differences between participants who complete studies online and on-campus. Participants who completed the study online were largely recruited through social media and word of mouth, and were not provided any monetary

incentive, thus likely participated due to their interest in the subject matter ï dogs. This self-selected group of participants likely differs from the online group of participants that were recruited through personal visitation to university course classroom and visually-appealing posters, both of which informed them of the $10 compensation for their participation. Thus, online and on-campus groups were likely differently motivated to complete the study. The ease of sharing the online study, particularly with contacts known to be interested in the subject, is likely responsible for the large online sample size, which also spanned a large geographical area. Such a large sample size, however, must be dealt with carefully, as very small effects might be found to be statistically significant when, in practical terms, they do are not meaningful. To counteract this, a more stringent alpha value for statistical analyses was set at $p < .01$ for the online sample. It is remarkable, though, that even with such a large sample size, for which small effects in support of BBDS should be easily detectable, there was no consistent dark-coat bias uncovered. The current study thus suggests that BBDS did not influencing participantsô dog coat colour preferences in a global way.

Culturally Significant Breeds

Overall, all Canadians, including NLers, preferred the black Labrador Retriever to the chocolate-coated counterparts; however, there was no preference between black and yellow coats. Overall, chocolate Labrador Retrievers were least preferred of the three coat colours. These results are in direct contrast to the findings found by Coren (2011) in British Columbia, where he asked participants to rate dogs on various traits and found that the ratings for Labrador Retrievers correlated with the degree of coat darkness; i.e., yellow Lab were given the most favourable ratings, However, Coren (2011) did not ask participants to directly compare dogs of

different coat colours, as did the current study, which might explain some of the discrepancy in outcome.

Individual Breeds

Individual breeds were examined to determine whether there were some physical characteristics that were preferred universally, or whether preferences for traits varied within breed groups. The results showed that individual breeds were treated mostly independently from their breed group, that is, there was considerable variability in coat colour preference within breed groups. As such, the mean preference score for a breed group may not accurately reflect participantsô preferences at the breed level. It may be that even dogs that can be categorized within related subgroups by shared history and/or behaviour and/or conformation are not subjected to a general BBDS bias. Rather, dog breeds may be influenced by the public's prototypic vision of what constitutes a breed, including their appearance.

Coat Type

A consistent main effect of breed group emerged in Coat Type analyses, suggesting similar to Coat Colour preferences, there are no consistent, universal preferences for either long or short coat types. Although Coat Type preferences may not speak to the BBDS directly, it may contribute to the discussion of whether it is *big* black dog syndrome, or a bias towards all black dogs regardless of size, due to long or rough-coated dogs possibly appearing larger than their short or smooth-coated counterparts. Interestingly, awareness of BDDS did appear to influence Coat Type preferences for participants in the Shelter condition; that is, BBDS aware participants made more long coat selections than did BBDS unaware participants. No preferences emerged for either the congruent or incongruent Breeder conditions. This finding suggests that long or

rough coats may be considered a less desirable characteristic in shelter dogs, for which BBDS aware participants may compensate by making a greater number of long coat selections.

Future Directions

Additional research is needed to identify the influences that affect coat colour preferences, whether those preferences are inherent or learned, as well as influences that may shape preferences (e.g., being aware of BBDS, exposure effects, etc.). If the occurrence of specific coat colours in dogs could be measured in specific geographic regions, statistical analyses could be conducted to examine whether the number of large and/or dark-coated dogs in regional shelters is representative of the local canine population.

Furthermore, the validity of internet-based studies should be further examined, particularly as a means to easily recruit participants from different geographical locations. The difficulty in recruiting a more diversified sample in traditional on-campus studies limits the scope of preference studies, especially when age and housing demographics might be expected to influence the variable being examined. Such demographic factors were examined in the current study as they were thought to possibly influence dog coat preferences; the data, however, did not offer much support for their importance.

Although there were instances when coat colour preferences emerged, they did so for both light and dark coats. There was really no systematic bias against the dark-coated dogs detected within breed groups. When individual breeds were examined, the results showed that breeds composing a breed group were not necessarily perceived similarly. It appears that dog coat colour preference among people is variable, and is influenced by dog breed/type. Thus, the current study did not find support for BBDS, despite it being a well-known concept that many

participants reported being aware of. Rather, the data suggest that coat colour preferences can be influenced by geographic region, and, as such, BBDS may operate at a local level is some areas. However, these data, along with the findings from other studies, suggest that the existence of BBDS as a global phenomenon affecting the adoption of big, black dogs is highly unlikely.

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APPENDIX 1: Pilot Study Participant Response Sheet

Participant Response Sheets

Date: _____

Condition: _____

You will be presented with 15 dog photographs on a computer screen one by one. As you view each photograph, rate it on a 7-point scale using six pairs of adjective (see below). Take as much time as you need to make your responses. When you are finished, hit any key to view the next photograph.

This experiment should take between 5-10 minutes to complete. At the end of the 15 photographs, the computer screen will thank you for your participation. Please deposit your response booklet into the basket and see the researcher to enter a draw for a $50 gift card to the pet store of your choice.

Attractive	1	2	3	4	5	6	7 Unattractive
Unfriendly	1	2	3	4	5	6	7 Friendly
Good pet	1	2	3	4	5	6	7 Bad pet
Sociable	1	2	3	4	5	6	7 Aloof
Aggressive	1	2	3	4	5	6	7 Non-aggressive
Easy-going	1	2	3	4	5	6	7 Difficult

Appendix 1. Pilot study participant response sheet

APPENDIX 2: Main Study Consent Form

Consent Form

Project Title: Human Preferences of Dog Photographs

Researcher: Kalita McDowell, MSc Candidate
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Supervisor: Dr. Carolyn Walsh
Canine Research Unit, Department of Psychology
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This form is part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more details about the research, feel free to ask. Please take the time to read this carefully and to understand any other information given to you by the researcher.

It is entirely up to you to decide whether to take part in this research. If you choose not to participate or if you decide to withdraw from the experiment once it has started, there will be no negative consequences for you, now or in the future.

Introduction & Purpose: There are over 400 breeds of dog recognized internationally that span a large range of body types and physical traits. The purpose of this study is to investigate whether there are consistencies in preferences among different people when viewing unfamiliar dogs.

Task Requirements & Duration: In this experiment you will be shown a total of 200 preference trials (4 practice pairs followed by 196 test pairs) of dog photographs depicting a large range of dog breeds and

types on a computer screen. Each pair will consist of two different dogs of the same breed. Your task will be to imagine that these dogs are available for adoption. You will select the dog out of each pair that you prefer by checking the box beside the statement which best relates to your preference. You will see each pair of photos until you make a response. You are free to take as much time as you need before making a response. Then click "Next" to move to the next pair of photographs. After seeing the photos, you will be asked 1) to complete a short dog breed identification task 2) to provide some non-identifying demographic information, and 3) to provide information regarding your experience with dogs.

Possible Benefits/Risks: You may find this task interesting as you are presented with photos representing a large range of dog breeds and body types. Your data will contribute to our current understanding of how people perceive dogs. We do not expect you to experience any risk or discomfort during our study.

Confidentiality and Anonymity: No individually-identifying information will be collected so your personal identity or name cannot be connected with your data, or with this research project in any way. Your anonymous data will be seen only by the researchers involved in this study and will be used solely for research purposes. Please note that the survey is hosted by "Survey Monkey", which is a web survey company located in the USA. If you choose to participate in the survey you understand that your responses to the survey will be stored and accessed in the USA. This company is subject to U.S. laws, in particular, to the U.S. Patriot Act that allows authorities access to the records of internet service providers.

Data Storage: Data will be stored for a minimum of five years, as per Memorial University policy on Integrity in Scholarly Research. We will transfer responses into an electronic data file and store it indefinitely on a password-protected computer in the Canine Research Unit lab; no identifying information will be stored with these e-data. Data collected from SurveyMonkey will be permanently deleted from their server upon completion of the data collection portion of the study.

Reporting of results: Data collected from this study will be used to complete my Masterôs dissertation. A summary of the study findings will be posted on the Canine Research Unit (CRU) website: http://dogsbody.psych.mun.ca/cru/ after the study is completed.

The proposal for this research has been reviewed by the Interdisciplinary Committee on Ethics in Human Research and found to be in compliance with Memorial Universityôs ethics policy. If you have ethical concerns about the research (i.e. your rights as a participant), you may contact the Chairperson of the ICEHR at icehr@mun.ca or by telephone at 709-864-2861.

Your Consent: Your signature on this form means that you have read the information about the research, have received satisfactory answers to all questions, understand what the experiment is about and what you will be doing, and understand that your participation in this research is completely voluntary. You are free to withdraw at anytime without explanation. If you sign this form, you do not give up your legal rights and do not release the researchers from their professional obligations. A copy of this consent form has been given to me if I have indicated a desire for such.

Your signature: "I have read and understand the description provided. I have had an opportunity to ask questions and my questions have been answered. I consent to participate in the research project, understanding that I may withdraw my consent at any time."

APPENDIX 3: Main Study Task Instructions

SHELTER Version:

For this study, imagine you are looking for a dog. You contact a local shelter and inquire about available dogs. The shelter responds by sending you photos of available dogs.

You will see a pair of dogs (Dog 1 and Dog 2) on each page. Based only on these photos (there is no additional information about the dogs available), your task is to select the dog you prefer from each pair.

The next pages will show examples for you to practice.

Photo Disclaimer: The photographs used in this study were found by using Google images and are, thus, freely and publicly available, though certain images may be subject to copyright. They are reproduced here for educational and research purposes, and, as such, are used under rules of Fair Use (USA) and Fair Dealing (Canada). The researchers are not profiting financially in any way from use of these images. If you own the copyright to one of these images and wish for it to be removed, please contact kem737@mun.ca.

BREEDER Version:

For this study, imagine you are looking for a dog. You contact a dog breeder and inquire about available dogs. The breeder responds by sending you photos of available dogs.

You will see a pair of dogs (Dog 1 and Dog 2) on each page. Based only on these photos (there is no additional information about the dogs available), your task is to select the dog you prefer from each pair.

The next pages will show examples for you to practice.

Photo Disclaimer: The photographs used in this study were found by using Google images and are, thus, freely and publicly available, though certain images may be subject to copyright. They are reproduced here for educational and research purposes, and, as such, are used under rules of Fair Use (USA) and Fair Dealing (Canada). The researchers are not profiting financially in any way from use of these images. If you own the copyright to one of these images and wish for it to be removed, please contact kem737@mun.ca.

APPENDIX 4: Breed Identification Task

Great! You have now completed all the preference trials!

You will now be presented with a short, multiple-choice breed identification task. You will be shown 20 photographs of a single dog with a list of 4 breed names below each. Your task is to select the name of the breed depicted in the photograph.

Dog Presented	**Response Options**
Collie	Border Collie
	Old English Sheepdog
	Collie
	Australian Cattle Dog
Afghanhound	Afghan Hound
	Chinese Crested Dog
	Greyhound
	Scottish Deerhound
Pekingnese	Samoyed
	Pekingnese
	Cavalier King Charles Spaniel
	Chihuahua
Newfoundland	St. Bernard
	Germand Shepherd Dog
	Tibetan Mastiff
	Newfoundland
Standard Poodle	Curly Coat Retriever
	Bouviers de Flandres
	Poodle (standard)
	Schnauzer
West Highland Terrier	
	West Highland White

	Terrier
	Boston Terrier
	Poodle (miniature)
	Japanese Chin
Golden Retriever	
	Irish Setter
	Golden Retriever
	Labrador Retriever
	Portugese Water Dog
Bull Terrier	Old English Mastiff
	Bull Terrier
	American Pit Bull Terrier
	Rat Terrier
Basset Hound	Pembroke Welsh Corgi
	Bloodhound
	Dachshund
	Basset Hound
Siberian Husky	Bernese Mountain Dog
	Chow Chow
	American Eskimo Dog
	Siberian Husky
Bichon Frise	Shetland Sheepdog
	Manchester Terrier
	Bichon Frise
	Havanese
Great Dane	Belgian Malinois
	Pharaoh Hound
	Boxer
	Great Dane
English Bulldog	English Bulldog
	Miniture Bull Terrier
	Pug
	Boxer
Black and Tan Coonhound	
	Doberman

	English Setter
	Beagle
	Black and Tan Coonhound
Shih Tzu	Affenpinscher
	Bedlington Terrier
	Silky Terrier
	Shih Tzu
Boston Terrier	Jack Russell Terrier
	Boston Terrier
	French Bulldog
	Whippet
Labrador Retreiver	
	Weimaraner
	Australian Cattle Dog
	Labrador Retreiver
	German Shorthair Pointer
Komondor	Giant Schnauzer
	Komondor
	Bearder Collie
	Irish Wolfhound
Cocker Spaniel	Pekingnese
	Cocker Spaniel
	Otterhound
	Papillon
Yorkshire Terrier	Lhasa Apso
	Welsh Terrier
	Pomeranian
	Yorkshire Terrier